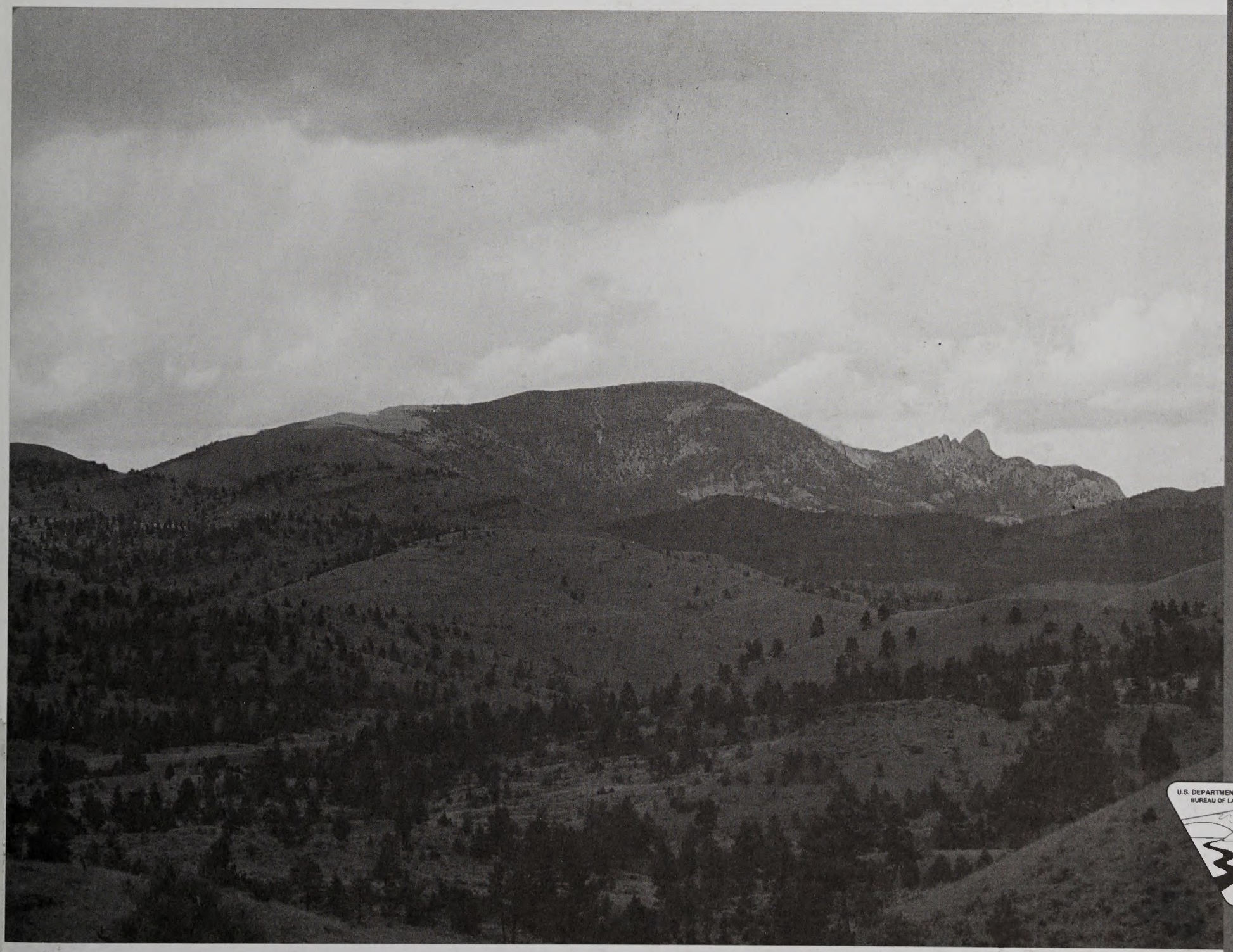
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PROPOSED

Butte Resource Management Plan and Final Environmental Impact Statement

VOLUME I

September 2008



Butte Field Office

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BLM

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based on the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation; rangelands; timber; minerals; watershed; fish and wildlife; wilderness; air; and scenic, scientific, and cultural values.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Butte Field Office
106 North Parkmont
Butte, Montana 59701-3388
Telephone: 406-533-7600
http://www.blm.gov/mt/st/en/fo/butte_field_office.html

TAKE PRIDE IN AMERICA

In Reply To:
1610 (070)

September 2008

Dear Reader:

Enclosed for your review is the Proposed Resource Management Plan/Final Environmental Impact Statement (Proposed RMP/Final EIS) for the Butte Field Office. The Bureau of Land Management (BLM) prepared the Proposed RMP/Final EIS, taking into account public comments received during this planning effort. The Proposed RMP/Final EIS provides a framework for the future management direction and appropriate use of the Butte Field Office, located in Beaverhead, Broadwater, Deer Lodge, Gallatin, Jefferson, Lewis and Clark, Park, and Silver Bow counties. The document contains both land use planning decisions and implementation decisions to guide the BLM's management of the Butte Field Office. Both the Proposed RMP/Final EIS and the Draft RMP/EIS are available on the Butte RMP website at http://www.blm.gov/mt/st/en/fo/butte_field_office.html.

The Proposed RMP/Final EIS have been developed in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Federal land Policy and Management Act (FLPMA) of 1976. The Proposed RMP/Final EIS is largely based on Alternative B, the Preferred Alternative in the Draft RMP/EIS, which was released on June 8, 2007. The Proposed RMP/Final EIS contains the Proposed Plan, a summary of changes made between the Draft RMP/EIS and Proposed RMP/Final EIS, predictable impacts of the Proposed Plan, a summary of the written and verbal comments received during the public review period for the Draft RMP/EIS, and responses to the comments.

Pursuant to the BLM's planning regulations at 43 CFR 1610.5-2, any person who participated in the Butte RMP planning process and has an interest which is or may be adversely affected by approval of this Proposed RMP and the land use plan decisions contained within it may protest the plan within 30 days from the date the Environmental Protection Agency publishes its Notice of Availability in the Federal Register. For further information on filing a protest, please see the accompanying protest regulations in the pages that follow (labeled as Attachment #1). The regulations specify the required elements of your protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents. To aid in ensuring the completeness of your protest, a protest checklist is attached to this letter (labeled as Attachment #2). This is also available online on the Butte RMP website. Press releases on the actual date ending the protest period will be sent to local and regional media contacts and information will be placed on the Butte RMP website.

Only those persons or organizations who participated in the planning process leading to this Proposed RMP may protest. A protesting party may raise only those issues submitted for the record during the planning process leading up to publication of this Proposed RMP. New issues may not be brought into the record at the protest stage.

Electronic mail and faxed protests will not be accepted as valid protests unless the protesting party also provides the original letter by either regular or overnight mail postmarked by the close of the protest period. Under these conditions, the BLM will consider the email or faxed protest an advance copy and will afford it full consideration. If you wish to provide the BLM with such advance notification, please direct faxed protests to the attention of the BLM protest coordinator at 202-452-5112, and e-mailed protests to Brenda Hudgens-Williams@blm.gov.

All protests, including the follow-up letter (if e-mailing or faxing) must be in writing and mailed to the following address:

Regular Mail:
Director (210)
Attention: Brenda Williams
P.O. Box 66538
Washington, D.C. 20035

Overnight Mail:
Director (210)
Attention: Brenda Williams
1620 L Street, N.W., Suite 1075
Washington, D.C. 20036

ITEM HAS BEEN DIGITIZED

Before including your address, phone number, e-mail address, or other personal identifying information in your protest, be advised that your entire protest – including your personal identifying information – may be made publicly available at any time. While you can ask us in your protest to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

The BLM Director will make every attempt to promptly render a decision on each protest. The decision will be in writing and will be sent to the protesting party by certified mail, return receipt requested. The decision of the BLM Director shall be the final decision of the Department of the Interior.

Upon resolution of all land use plan protests, the BLM will issue an Approved RMP and Record of Decision (ROD). The Approved RMP and ROD will be mailed or made available electronically to all who participated in the planning process and will be available to all parties through the "Planning" page of the BLM national website (http://www.blm.gov/planning), or by mail upon request.

The Proposed RMP/Final EIS contains land use planning decisions subject to protest with the exception of decisions on site-specific travel plans. **Decisions on travel route-specific management for the Helena Travel Planning Area (TPA), East Helena TPA, Lewis and Clark County NW TPA, Boulder/Jefferson City TPA, and Upper Big Hole River TPA are not protestable.** Unlike land use planning decisions, implementation decisions are not subject to protest under the BLM planning regulations, but are subject to an administrative review process, through appeals to the Office of Hearings and Appeals (OHA), Interior Board of Land Appeals (IBLA) pursuant to 43 CFR, Part 4, Subpart E. Implementation decision generally constitute the BLM's final approval allowing on-the-ground actions to proceed. Where implementation decisions are made as part of the land use planning process, they are still subject to the appeals process or other administrative review as prescribed by specific resource program regulations once the BLM resolves protest to land use planning decisions and issues an Approved RMP and ROD. The Approved RMP and ROD will therefore identify the implementation decisions made in the plan that may be appealed to the Office of Hearings and Appeals.

Sincerely,

Richard M. Hotaling

Butte Field Manager

ATTACHMENT #1

43 CFR 1610.5–2 PROTEST PROCEDURES

(a) Any person who participated in the planning process and has an interest which is or may be adversely affected by the approval or amendment of a resource management plan may protest such approval or amendment. A protest may raise only those issues which were submitted for the record during the planning process.

(1) The protest shall be in writing and shall be filed with the Director. The protest shall be filed within 30 days of the date the Environmental Protection Agency published the notice of receipt of the final environmental impact statement containing the plan or amendment in the FEDERAL REGISTER.

For an amendment not requiring the preparation of an environmental impact statement, the protest shall be filed within 30 days of the publication of the notice of its effective date.

(2) The protest shall contain:

(i) The name, mailing address, telephone number, and interest of the person filing the protest;

(ii) A statement of the issue or issues being protested;

(iii) A statement of the part or parts of the plan or amendment being protested;

(iv) A copy of all documents addressing the issue or issues that were submitted during the planning process by the protesting party or an indication of the date the issue or issues were discussed for the record; and

(v) A concise statement explaining why the State Director's decision is believed to be wrong.

(3) The Director shall promptly render a decision on the protest. The decision shall be in writing and shall set forth the reasons for the decision.

The decision shall be sent to the protesting party by certified mail, return receipt requested.

(b) The decision of the Director shall be the final decision of the Department of the Interior.

ATTACHMENT #2

Resource Management Plan
Protest Critical Item Checklist

The following items *must* be included to constitute a valid protest whether using this optional format, or a narrative letter.
(43 CFR 1610.5-2)

BLM's practice is to make comments, including names and home addresses of respondents, available for public review. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment--including your personal identifying information--may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations and businesses, will be available for public inspection in their entirety.

Resource Management Plan (RMP) or Amendment (RMPA) being protested:

Name:
Address:
Phone Number: ( )

Your interest in filing this protest (how will you be adversely affected by the approval or amendment of this plan?):

Issue or issues being protested:

Statement of the part or parts of the plan being protested:
Chapter:
Section:
Page:
(or) Map:

Attach copies of all documents addressing the issue(s) that were submitted during the planning process by the protesting party, <u>OR an indication of the date the issue(s) were discussed for the record</u>.
Date(s):

A concise statement explaining why the State Director's decisions is believed to be wrong:

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PROPOSED
BUTTE RESOURCE MANAGEMENT PLAN
AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

BUTTE FIELD OFFICE

BUTTE, MONTANA

ITEM HAS BEEN DIGITIZED

SEPTEMBER 2008

PROPOSED
BUTTE RESOURCE MANAGEMENT PLAN
AND
FINAL ENVIRONMENTAL IMPACT STATEMENT

1. Responsible Agency:

   United States Department of the Interior,
   Bureau of Land Management

2. Draft ( ) Final (X)

3. Type of Action: Administrative (X) Legislative ( )

4. Abstract: The Proposed Resource Management Plan and Final Environmental Impact Statement describes and analyzes four alternatives for managing the public lands and resources administered by the Bureau of Land Management's Butte Field Office and located in southwestern Montana in Beaverhead, Broadwater, Deer Lodge, Gallatin, Jefferson, Lewis and Clark, Silver Bow, Park, and Beaverhead Counties. These alternatives are: Alternative A (continuation of current management, or the No Action Alternatives); Alternative B (Preferred Alternative) and Alternatives C and D. Major RMP issues include vegetation communities; wildlife, wildlife habitat, special status and priority plant and animal species; travel management and access; recreation; and special designations including Areas of Critical Environmental Concern, National Trails, Wild and Scenic Rivers, and Wilderness Study Areas. The alternatives present a range of management actions to achieve goals and desired future conditions for the Butte Field Office.

5. Protests on the Proposed Resource Management Plan and Final Environmental Impact Statement must be postmarked within 30 days from publication of the Notice of Availability by the Environmental Protection Agency. The close of the protest period will be announced in news releases and on the RMP website at www.blm.gov/mt/st/en/fo/butte_field_office.html.

6. For further information, contact:

Tim La Marr, RMP Team Leader
Bureau of Land Management, Butte Field Office
106 North Parkmont
Butte, MT 59701
(406) 533-7645
Timothy_LaMarr@blm.gov

ACRONYMS

°C	Degrees Celsius
ACEC	Area of Critical Environmental Concern
AG	Artic Grayling
AML	Abandoned Mine Lands
AMS	Analysis of the Management Situation
APLIC	Avian Power Line Interaction Committee
ATV	All Terrain Vehicle
AUM	Animal Unit Month
B.P.	Before Present
BBER	The University of Montana's Bureau of Business and Economic Research
BCFG	Billion Cubic Feet of Gas
BFO	Butte Field Office
BLM	Bureau of Land Management
BMP	Best Management Practice
BT	Bull trout
CCF	Hundred Cubic Feet
CEQ	Council on Environmental Quality
CFL	Commercial Forest Land
CFR	Code of Federal Regulations
CSU	Controlled Surface Use Stipulation
DA	Decision Area
DBH	Diameter at Breast Height
DNRC	Montana Department of Natural Resources
DOE	Department of Energy
DOI	US Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMU	Elk Management Unit
EPA	Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAMS	Facility Asset Management System
FAR	Functioning At Risk
FLPMA	Federal Land Policy and Management Act
FMU	Fire Management Unit
FO	Field Office
FRCC	Fire Regime Condition Class
GCC	Global Climate Change
GHG	Greenhouse Gas
GIS	Geographic Information System
HUC	Hydrologic Unit Code
IGBC	Interagency Grizzly Bear Committee
IM	Instructional Memorandum
ITRR	The University of Montana's Institute for Tourism and Recreation Research
KGRA	Known Geothermal Resource Area
LWCF	Land and Water Conservation Fund
MAAQS	Montana Ambient Air Quality Standards
MBF	Thousand Board Feet
MBMG	Montana Bureau of Mines and Geology
MBOGC	Montana Board of Oil and Gas Conservation
MBTSG	Montana Bull Trout Scientific Group
MCF	Thousand cubic feet
MDEQ	Montana Department of Environmental Quality
MFP	Management Framework Plan
MFWP	Montana Fish, Wildlife and Parks
MLA	Mineral Leasing Act
MMBF	Million Board Feet
MMBO	Million Barrels Of Oil
mph	Miles per hour
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NDA	No Data Available
NEPA	National Environmental Policy Act
NFU	Nonfunctioning
NL	No Lease
NO_2	Nitrogen Dioxide
NOI	Notice of Intent
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NSO	No Surface Occupancy Stipulation
NW	Northwest
OHV	Off-Highway Vehicle

PA	Planning Area
PEIS	Programmatic Environmental Impact Statement
PILT	Payment in Lieu of Taxes
PM_{10}	Particulate Matter less than 10 micrograms
$PM_{2.5}$	Particulate Matter less than 2.5 micrograms
ppm	Parts per million
PPS	Proposed Planning Scenario
PSQ	Probable Sale Quantity
R&PP	Recreation and Public Purposes
RFD	Reasonably Foreseeable Development
RMP	Resource Management Plan
RMZ	Riparian Management Zone
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	Right-of-way
RTM	Recreation Tourism Market
SIMPPLLE	Simulating Patterns and Processes at Landscape Scales
SLT	Standard Lease Terms
SMRA	Special Recreation Management Area
SMZ	Streamside Management Zone
SO_2	Sulfur Dioxide
TL	Timing Limitation Stipulation
TMDL	Total Maximum Daily Load
TPA	Travel Planning Area
TPCC	Timber Production Capability Classification
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VRM	Visual Resource Management
VUD	Visitor Use Days
WCT	Westslope Cutthroat Trout
WFIP	Wildland Fire Implementation Plan
WFU	Wildland Fire Use
WSA	Wilderness Study Area
WSR	Wild and Scenic River
WUI	Wildland/Urban Interface
YCT	Yellowstone Cutthroat Trout

Preparation of this document was guided by United States Department of the Interior (USDI) Bureau of Land Management (BLM) planning regulations issued under the authority of the Federal Land Policy and Management Act (FLPMA) of 1976 and federal environmental policy under the National Environmental Policy Act (NEPA) of 1969. The Draft Resource Management Plan/Environmental Impact Statement (RMP/EIS) primarily focuses on five planning issues and the decisions needed to resolve them. The issues were identified through public scoping, concerns raised to BLM staff in interactions with public land users, and resource management concerns of the BLM and cooperating agencies. The issues are:

- vegetation communities;
- wildlife, wildlife habitat, special status and priority plant and animal species;
- travel management and access;
- recreation including national trails, visual resources, wild and scenic rivers, and wilderness; and
- Areas of Critical Environmental Concern (ACEC).

Other management concerns were addressed in the RMP, but do not drive the formulation of the alternatives. To assist agency decision-makers and the general public in choosing appropriate solutions to the planning issues, four alternatives were proposed and their impacts evaluated. The alternatives were limited to those that span a reasonable way of managing public lands and federal minerals, while offering a broad range of options.

Enclosed with the Proposed RMP/Final EIS is a compact disk of "Supplemental Electronic Files". This disk contains a "Readme.txt" file and four folders: "Acrobat Reader", "AMS Figures", "Grazing Allotment Maps", and "Travel Plan Maps". The "Readme.txt" file contains guidance on the additional information contained on the disk and how to access it. The "Acrobat Reader" folder contains a version of Adobe Acrobat Reader that will enable readers to view the maps in other folders.

The Proposed RMP/Final EIS is designed to be used in conjunction with map information provided in the Draft RMP/EIS. Only maps where substantive information has changed since release of the Draft RMP/EIS have been produced for the Proposed RMP/Final EIS. These maps are listed in the Map Changes section at the end of Chapter 1.

DOCUMENT SECTIONS

The format of the EIS follows the Council on Environmental Quality's (CEQ) regulations implementing the NEPA (40 CFR 1500). The major sections of the EIS include:

Executive Summary

The Executive Summary provides an overview of information detailed in the full document and serves as a synopsis of the planning issues, alternatives and potential environmental consequences.

Chapter 1 (Purpose and Need)

This chapter contains background information on the planning process and sets the stage for the information that is presented in the rest of the document. The main sections in Chapter 1 include the Overview, Purpose and Need for Revising the Plan, Decisions from this Plan, Description of the Planning Area, Scoping and Planning Issues, Planning Criteria and Regulatory Requirements, Planning Process, Related Plans, Policy, Collaboration and Overall Vision and Desired Future Conditions. The final section of Chapter 1 describes Changes from the Draft RMP to the Proposed RMP. Substantive text revisions are shaded in gray throughout the Proposed RMP/Final EIS.

Chapter 2 (Alternatives)

This chapter provides the description of management scenarios proposed for lands managed by the BLM within the Butte Field Office Planning Area. This chapter explains how alternatives were developed and, provides an overview of the four alternatives considered in detail, states the goals for management of resources, and describes the management actions by planning issue and management concern for each alternative, those common to all the alternatives and those common to the action alternatives. Alternatives that were considered but not analyzed in detail are discussed along with rationale for why they were not considered in detail. Finally, there is a table that shows the management actions in each alternative for easy comparison, followed by a table comparing the effects of each alternative.

Chapter 3 (Affected Environment)

This chapter describes the current condition of the Planning Area. This chapter is organized by resource, resource use, special designation, and social and economic conditions.

Chapter 4 (Environmental Consequences)

This chapter describes the projected impacts and changes that would result with implementation of each of the alternatives. There are two fundamental parts of this chapter. The first part of this chapter (in Volume I) discusses environmental consequences of RMP alternatives. The RMP alternatives section starts with an explanation of the types of effect discussed, followed by assumptions that were made in the analysis for each resource. The effects are organized by resource and resource use. Each resource/resource use section describes

direct and indirect effects common to all alternatives, effects of Alternative A (No Action), effects common to the action alternatives, then effects of Alternative B, Alternative C and Alternative D. The cumulative effects section follows, with an introduction and listing of activities considered in the analysis and the cumulative effects. The RMP alternatives section closes out with the analysis of irreversible and irretrievable commitment and unavoidable adverse impacts. While details of the impacts are provided in this chapter, the summary table of impacts is found at the end of Chapter 2.

The second part of this chapter (in Volume II) discusses environmental consequences of the alternatives for the five site-specific travel plans, organized by travel planning area. Direct/indirect and cumulative effects on each resource or resource use are discussed at the scale of each travel planning area. The chapter concludes with a discussion of cumulative effects of the travel plan alternatives for all five travel planning areas in aggregate at the Decision Area/Planning Area scales.

Chapter 5 (Consultation and Coordination)

This chapter describes public involvement efforts and collaborative processes, lists of agencies, and organizations receiving the document, and identifies the preparers of the RMP/EIS. It also includes disclosure of substantive public comments received and the BLM's responses to those comments.

References

Scientific publications and other references used as supporting information are listed in alphabetical order here.

Glossary

Technical terms and phrases with specific policy meaning or definition are explained in more detail.

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Terms frequently referenced are listed along with the page numbers where they occur.

OTHER INFORMATION

Tables and **Figures** have been included throughout the document to display and summarize pertinent information. While several **Maps** are nested within Volume I, most of the maps are oversized and are provided in a packet with an envelope. In the Proposed RMP/Final EIS, only maps where substantive information has changed since the Draft RMP/EIS have been reproduced.

Acreages displayed in this document should be considered approximations even when displayed to the nearest acre. Most acreages were calculated from GIS coverages (considered the best available information by the BLM for the scale of this planning effort) and as a result may not match acres provided in prior published documents that contained calculations from master title plats or other base data. In other instances, acres have been rounded as analysis was completed. These rounded figures should also be considered approximations. The data used throughout this document is for land use planning purposes and not necessarily for actual on-the-ground implementation. The precision afforded by GIS calculation does not reflect project level accuracy. Acreage figures provided in this document for land use plan analysis purposes will be refined as subsequent site-specific analysis is conducted. Data used in development of the RMP is dynamic. Updating data is considered a plan maintenance action and will be incorporated over time as the RMP is implemented.

Appendices provide more detail on some subjects. Some appendices may contain several pieces of information related to the appendix topic.

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EXECUTIVE SUMMARY

OVERVIEW

The United States Department of the Interior (DOI), Bureau of Land Management (BLM) has prepared this revision of the Resource Management Plan (RMP) to provide direction for managing public lands under the jurisdiction of the Butte Field Office (BFO) in mid-western Montana and an environmental impact statement (EIS) to analyze the environmental effects that could result. The affected lands are currently being managed under two plans: the Headwaters Resource Management Plan (USDI-BLM 1984) and the Dillon Management Framework Plan (MFP) (USDI-BLM 1979). The Headwaters RMP has been formally amended on eight occasions and the Dillon MFP has been formally amended on three occasions. In addition, several new laws, regulations, and policies have affected management of public land since approval of both plans. For lands administered by the Butte Field Office, this RMP revision will replace the Headwaters RMP and the Dillon MFP.

Land use planning is used to manage resources and to designate uses on public lands in coordination with tribal, state, and local governments, land users, and interested public. This RMP: 1) incorporates new information about resources and resource uses and regulatory guidance that has come into existence since establishment of the Headwaters RMP and Dillon MFP over 20 years ago, and 2) provides management direction where it may be lacking or requires clarification. The RMP is being revised according to guidance in the Federal Land Policy and Management Act (FLPMA) of 1976 (43 US Code [USC] 1701 et seq.) and BLM's Land Use Planning Handbook, H-1601-1. An EIS is incorporated into this document as required by the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508) (CEQ 1978), and requirements of BLM's NEPA Handbook, H-1790-1 (USDI-BLM 2008a).

PURPOSE OF AND NEED FOR REVISING THE PLAN

The purpose of the RMP is to provide a single, comprehensive land use plan to guide management of public lands administered by the BFO. The plan provides objectives, land use allocations, and management direction to maintain, improve, or restore resource conditions and to support the long-term economic needs of local communities.

Since the original plans were approved, several conditions have changed. These include:

- Changed ecological, socioeconomic, institutional, and regulatory conditions;
- Many new laws, regulations, and policies that invalidate or supersede previous decisions;
- Changing user demands and activities;
- Changing acceptance of impacts; and
- Changes in the BFO boundaries.

These conditions drive the need for an inclusive, comprehensive plan that provides updated, clear direction to both the BLM and the public.

The purpose of site-specific travel planning is to develop travel plans that meet the needs of public and administrative access, are financially affordable to maintain, and minimize user conflicts and natural resource impacts associated with roads and trails, in part as per 43 CFR 8342. There is a need to do this because in many portions of the BFO, travel planning has not ever been conducted in a manner to establish a managed transportation network that meets these regulations and fully considers public and administrative needs, user conflicts, and natural resource impacts.

DECISIONS FROM THIS PLAN

This RMP will provide the basis for two types of decisions. Land Use Plan decisions will be those associated with management prescriptions and activities tied to the various Resource and Resource Use visions, desired future conditions, and goals in the plan. Management, such as the range of acres for vegetation treatments by alternative, Fire Management Unit designations, and whether or not to implement Riparian Management Zones are examples of Land Use Plan Decisions. The only implementation decisions to be made from this document will be associated with five site-specific travel plan areas (Helena, East Helena, Lewis and Clark County Northwest, Upper Big Hole, and Boulder/Jefferson City) where travel route-specific management decisions will be made.

ISSUES

PLANNING ISSUES

A planning issue is a relatively substantial controversy or dispute regarding management of resources or uses. These issues drive the formulation of the range of alternatives considered in this EIS.

Issue 1: Vegetation Communities

How will vegetation on BLM lands be managed to achieve healthy ecosystems while providing for a broad range of multiple uses?

Issue 2: Wildlife, Wildlife Habitat, Special Status and Priority Plant and Animal Species

How will BLM lands be managed to provide wildlife and fish habitat, and to conserve, and recover special status and priority species?

Issue 3: Travel Management and Access

How should the BLM manage motorized public travel to meet the needs for public access and resource uses while minimizing user conflicts and impacts to air, soil, watershed, vegetation, wildlife, and other resource valnes?

Issue 4: Recreation

How should recreation be managed to accommodate the full range of recreational uses enjoyed by the public on BLM lands?

Issue 5: Special Designations including ACECs, National Trails, Wild and Scenic Rivers, and WSAs

Which areas, if any, should be managed as special designations? How should they be managed to protect valnes that warrant their special designation status?

Management Concerns

Management concerns are topics that involve a resource, resource management activity or land use that generally do not have enough controversy surrounding them to generate different RMP alternatives to address them. While these concerns are addressed in the plan, management related to them may or may not change by alternative.

Management concerns included:

- Air Quality;
- Soil Resources;
- Water Resources;
- Cultural Resources, Traditional Cultural Properties and Paleontological Resources;
- Visual Resources;
- Lands and Realty;
- Minerals and Energy;
- Abandoned Mine Lands;
- Hazardous Materials;
- Social and Economic Environment;
- Prime or Unique Farm Land;
- Environmental Justice; and
- Tribal Treaty Rights including Native American Religious Concerns.

Desired Future Conditions

The overall vision for the Decision Area is expressed in the desired future conditions and management goals summarized below.

Issue 1: Vegetation Communities

The desired future condition is for vegetation to fall within the historic range of variability, with diverse, site-appropriate plant communities that contain healthy populations for native species.

- **Forests and Woodland** - Maintain or restore healthy stands of site appropriate species with a diversity of age classes and structure for wildlife habitat, soil stability, and wood products for present and future generations.
- **Upland and Riparian Resources** - Provide a sustained level of livestock grazing while maintaining healthy public land resources.
- **Wildland Fire Management** - Protect public health, safety, and property.

Issue 2: Wildlife, Wildlife Habitat, Special Status and Priority Plant and Animal Species

The desired future condition is for BLM lands to provide a diverse landscape with native vegetation communities that provide suitable habitat to maintain viable and well distributed populations of native wildlife species on public land.

Issue 3: Travel Management and Access

The vision is to provide a range of quality motorized and non-motorized opportunities, and reasonable access for management while protecting natural resources, now and in the future.

Issue 4: Recreation

The vision is to provide a range of quality recreation opportunities, services, and appropriate facilities for public use and enjoyment.

Issue 5: Special Designations including ACECs, National Trails, Wild and Scenic Rivers and Wilderness Study Areas

The vision is to protect relevant and important ACEC values and manage for appropriate uses; protect established National Trail values and manage for appropriate uses; protect Outstandingly Remarkable Values in Wild and Scenic River-eligible river segments and manage for

appropriate uses; protect wilderness characteristics in Wilderness Study Areas.

Management Concerns

Air Quality

Air resources are maintained to protect human health and the environment.

Soil Resources

Stable soils contribute to properly functioning watersheds and support productive plant communities consistent with site potential.

Water Resources

Water bodies have sufficient water quality to meet state and federal standards, and support designated beneficial uses.

Cultural Resources, Traditional Cultural Properties and Paleontological Resources

There is a minimal loss or degradation of cultural resources, traditional cultural properties, and paleontological resources within the BFO.

Visual Resources

A spectrum of visual qualities are provided and protected for the public. RMP alternatives establish Visual Resource Management (VRM) Classifications to guide the management of public land based on scenic quality, sensitivity levels, and distance zones.

Lands and Realty

The needs of the public are met and support for all BLM resource programs is provided.

Minerals and Energy

Use of geologic resources recognizes the need for domestic sources of energy and minerals.

Abandoned Mine Lands

Threats to human health and the environment from historic mining activities on public land are reduced.

Hazardous Materials

Employees, the public, and the environment are protected from exposure to hazardous materials in public facilities or on public land.

Social and Economic Environment

Conservation, stewardship, and partnerships on public land are cultivated for the use and enjoyment of present and future generations.

OVERVIEW OF THE ALTERNATIVES

There are four alternatives considered in detail. This section provides a brief overview of each of those alternatives. Alternatives considered in detail include one "No Action" Alternative (Alternative A), and three "action" alternatives (Alternatives B-D) that would reflect various levels of change from the existing Headwaters RMP and Dillon MFP direction.

All alternatives include management direction that is not being revised from current management established by the Headwaters RMP, Dillon MFP, or more recent policy or regulatory guidance. This direction is presented in the sections entitled "Management Common to All Alternatives" and is not described in this overview. Continued management direction reflects the following categories:

1. Management Direction from legal statute, regulation, or manual direction. This management direction may not have been specifically included in the Headwaters RMP or Dillon MFP but includes management direction for things such as restricted uses near bald eagle nests or current regional decisions on noxious weed abatement techniques.

2. Management Direction from the Headwaters RMP/Dillon MFP, including amendments by subsequent modifications from other decisions that are not being revised by the Butte RMP.

Some potential management options identified early in this planning process were resolved using one approach in the "action alternatives". These are identified under the category "Management Common to Action Alternatives" in the "Alternatives Considered in Detail" section. This management guidance represents areas where there was generally little controversy over that particular aspect of management. One example of this approach is the common management direction for the "action" alternatives to restore, maintain or improve ecological conditions of vegetation communities through the use of prescribed and managed wildland fire, prescriptive livestock grazing, planting, timber harvest, other mechanical methods, and exclusion of intense disturbance. These components are not included in this overview.

ALTERNATIVE A – NO ACTION

Alternative A is the continuation of present management, referred to as "No Action". This alternative would continue present management practices based on existing land use plans and other management decision documents. Direction contained in the Headwaters RMP and the Dillon Management Framework Plan would continue to be implemented. Direction contained in existing laws, regulations, and policies would also continue. The current levels, methods, and mix of multiple use management would continue, and resource values would receive

attention at present levels with relatively little specific management direction or priorities compared to other alternatives. Motorized access and motorized recreational opportunities would not change from the current condition. One ACEC (Sleeping Giant – 11,679 acres) would continue to be managed as such. Eligible Wild and Scenic River segments would continue to be managed to protect the values that make them eligible.

ALTERNATIVE B – PREFERRED ALTERNATIVE

This alternative emphasizes moderate levels of resource protection, use, and restoration. Alternative B places a priority on vegetative restoration. Quantities of forest-based commodity resources from vegetation restoration activities would be similar to Alternative A, greater than in Alternative C, but less than in Alternative D. Project-level wildlife habitat and riparian management measures would be greater than in Alternatives A and D due in part to establishment of Riparian Management Zones (RMZs) where managing for riparian values would be the focus, but less than in Alternative C where RMZs would be wider and with more protective management than under Alternative B.

Alternative B emphasizes more of a balance of motorized and non-motorized recreation and access opportunities compared to the other action alternatives (C and D). Four ACECs would be designated, totaling about 70,644 acres. Two rivers would be recommended as "suitable" for Wild and Scenic River designation. There would be more oil and gas leasing management measures than in Alternatives A and D, but less than in Alternative C.

Alternative B represents the mix and variety of actions that in the opinion of BLM, best resolves the issues and management concerns and is therefore considered BLM's Preferred Alternative.

ALTERNATIVE C

Alternative C emphasizes a lesser degree of vegetative restoration than any of the other alternatives. Production of forest-based commodity resources from vegetation restoration activities would be lowest of all alternatives. This alternative emphasizes a greater degree of project-level wildlife habitat and riparian management measures (wider Riparian Management Zones than Alternative B, no RMZs under Alternatives A or D) than in any other alternative.

Alternative C emphasizes non-motorized recreation opportunities more than the other alternatives. All potential Areas of Critical Environmental Concern (87,893 acres) would be designated with this alternative. All four river segments eligible for Wild and Scenic status would be found suitable and recommended for Wild and Scenic designation. Alternative C provides for the most oil and gas leasing management measures of any alternative.

ALTERNATIVE D

Alternative D emphasizes the greatest degree of active management to restore vegetative communities and would produce the greatest quantities of forest products from vegetation restoration activities of all alternatives. Alternative D features fewer wildlife habitat and riparian management measures than Alternatives B and C, but more than Alternative A.

This alternative emphasizes motorized access and recreation opportunities more than Alternatives B and C. Three ACECs would be designated (23,695 acres). No river segments eligible for Wild and Scenic status would be recommended as suitable for Wild and Scenic designation with this alternative. Alternative D would have the fewest oil and gas leasing management measures of all the alternatives.

ENVIRONMENTAL CONSEQUENCES

Effects on all resources from all actions are described in detail in Chapter 4. This section contains a summary of the effects by alternative as related to the Planning Issues.

ISSUE 1: VEGETATION COMMUNITIES

Grassland and Shrubland

In Alternative A, vegetation treatments would occur on 5,250 acres of grasslands and shrublands per decade. Because conifer encroachment into these habitats is occurring at a rate of approximately 6,411 acres per decade, conifer encroachment would continue to increase at a net rate of 1,161 acres per decade under Alternative A. Alternative B would restore up to 15,450 acres per decade of grassland and shrubland communities for a net increase in restored grassland/shrubland habitat on 9,039 acres per decade. Alternative C would treat up to 2,700 acres per decade resulting in a net increase in conifer encroachment (3,711 acres per decade) rather than an increase in restored habitat. Alternative D would treat up to 25,900 acres per decade resulting in a greater net increase in restored habitat (19,489 acres per decade) than under any other alternative.

In Alternative A, prescribed fire would reduce fuel loading and remove encroaching conifers and there would be no timing restrictions for prescribed burning. Under Alternative B prescribed burns would be planned to burn 80 percent by area (on average) of planned burn units, leaving conifers in a mosaic of unburned patches within units. Soil, grasses, and forbs would be protected from fire-related mortality during hotter drier months by imposed burning restrictions May-August. Prescribed burns to treat conifer encroachment in Alternative C would be planned to burn 60 percent by area (on average) of each unit (leaving more conifers in unburned patches than Alternative B) and would have the same

seasonal restriction as Alternative B. These prescribed burns in Alternative D would be planned to burn 90 percent of each unit without the seasonal restriction described above.

Alternative A would include no conversion of non-native grassland vegetation to native grasslands at McMasters Hills and Ward Ranch. Alternatives B, C, and D would convert up to 850 acres in these areas to native grasslands, which would provide benefits to grassland habitat in this area that would not occur with Alternative A.

Forests and Woodlands

In dry forest types, Alternative A would treat the least acres per decade (5,100 acres) to help restore historic conditions and still exceed the rate of decline in forest health. This would also be the case for cool, moist forest (2,400 acres of treatment/decade) to help restore historic conditions and still exceed the rate of decline in forest health. Alternative B would treat the second most acres of dry forest treated per decade (up to 14,750 acres) and cool, moist forest treated per decade (up to 3,750 acres). Alternative C would treat the least acreage (up to 4,800 and 500 acres, respectively), and vegetation would not be restored at a rate exceeding the rate of decline in forest health. Alternative D would treat the most acres of each (up to 18,200 and 5,050 acres, respectively) and would move the greatest number of forested acres back toward historic condition of all alternatives.

Under all action alternatives, timber harvest is considered a tool for meeting forest health and restoration goals. The following levels of forest product removal are directly related to the amount of forest health and ecosystem restoration proposed as follows. Alternative A would result in a Probable Sale Quantity (PSQ) of 12 to 27 Million Board Feet (MMBF) (40,000 to 97,000 Hundred Cubic Feet (CCF)) per decade. Alternative B would result in a PSQ of 9 to 25 MMBF (33,000 to 91,000 CCF) per decade. Alternative C would result in a PSQ of 5 to 12 MMBF (19,000 to 41,000 CCF) per decade. And, Alternative D would result in a PSQ of 10 to 30 MMBF (36,000 to 107,000 CCF) per decade.

Noxious Weeds

Proposed noxious weed treatments vary across the alternatives, mainly dependent on the amount of disturbance proposed by other management actions as well as the number of designated open roads. Alternative A would treat a minimum of 20,000 acres per decade, with Alternative B slightly higher at a minimum of 21,000 acres of treatment per decade. Management under Alternative C would result in the least amount of treatment at a minimum of 16,000 acres per decade, with the greatest amount of treatment in Alternative D at a minimum of 25,000 acres per decade. Even with continued or increased noxious weed treatments, all alternatives would result in a projected increase of noxious weeds infestations on public lands in the BFO. By the year 2015, infestations are projected to spread to 43,000 acres under Alternative A, 48,000 acres under Alternative B, 51,000 acres under Alternative C, and 47,000 acres under Alternative D. Alternative A would have the greatest amount of weed infestation associated with open roads at 67 acres, with Alternative B at 46 acres, Alternative C at 42 acres, and Alternative D at 52 acres.

Riparian

Alternative A would manage 3,270 acres of riparian and associated upland vegetation as Streamside Management Zones (SMZs) and mechanically treat or prescribe burn 30 acres of riparian vegetation per decade to restore communities to properly functioning condition. (This treatment figure is a continuation of what has occurred, however the Headwaters RMP allows treatment in all riparian areas subject to other management constraints.)

Alternatives B and C would both include the concept of Riparian Management Zones (RMZs) where riparian ecological health would be the primary focus. Alternative B would manage 10,461 acres of riparian and associated upland vegetation as RMZs and mechanically treat or prescribe burn up to 700 acres per decade to improve vegetative conditions. Alternative C would manage 19,620 acres as RMZs and mechanically treat or prescribe burn up to 200 acres per decade. Alternative D would manage the same amount of acres as SMZs as Alternative A. By mechanically treating or burning up to 1,700 acres per decade to meet site-specific riparian objectives, Alternative D would provide the shortest period required to restore riparian vegetation communities to proper functioning condition. Additional acres of riparian communities would be restored through implementation of livestock grazing guidelines and Abandoned Mine Land reclamation under all alternatives.

Wildland Fire Management

Alternative A provides for 7,300 acres of Category A fire management in which wildland fire is not desired and prescribed fire cannot be used as a fuels reduction tool. It treats the second least acres (12,780 acres/decade) for fuel reduction of all alternatives. Lower fuel levels would result in a reduced potential for high-severity fires. Alternative A provides the most opportunities for human caused wildland fire due to it having the greatest number of open road miles of all alternatives.

Alternative B provides more flexibility to manage fires since there would be no Category A designations. It treats the second most acres for fuels reduction (up to 34,650 acres/decade) and would reduce fire intensity and behavior, improve fire fighter safety, and move towards historic fire regimes more than Alternatives A and C. Extent of motorized access for fire suppression and fuel reduction treatments would be the second lowest of the alternatives. However, this also provides the second least

amount of opportunity for human-caused fire ignitions of all alternatives.

Alternative C would be the most restrictive fire management with most acres (41,000) of Category A fire management. The least acres would be treated for fuels reduction (up to 8,200 acres/decade), which would do the least of all alternatives to reduce fire intensity and behavior, improve wildland fire fighter safety and move toward historic fire regimes. It provides the least motorized access for fire suppression and fuel treatments and the fewest opportunities for human-caused wildland fire associated with road access.

Alternative D allows the greatest flexibility in fire management. It treats the most acres for fuels reduction (up to 50,850 acres/decade) and would do the most of any alternative to reduce fire intensity and behavior, improve wildland fire fighter safety, and move toward historic fire regimes. The second highest level of motorized access for fire suppression and fuel reduction treatments would be provided of all the alternatives, along with the second greatest opportunity for human-caused fire ignitions.

Issue 2: Wildlife, Wildlife Habitat, Special Status and Priority Plant and Animal Species

Wildlife

In all vegetation types, vegetation treatments under Alternative A would provide less restoration of habitat than Alternatives B and D. Alternative C would provide the least vegetation restoration of all alternatives. Alternative D would treat and restore more habitat than all other alternatives but would also have the most short-term adverse effects from treatments and temporary road construction than all other alternatives.

Alternative A would have the greatest miles of open road (471.8 miles open yearlong) and would have the least amount of road restrictions of all alternatives. This would cause the most negative impacts on wildlife and habitat from disturbance, road kill, habitat alteration and loss (from weeds, firewood cutting and trespass), and habitat fragmentation of all alternatives. Alternative B would have fewer open roads (263 miles open yearlong) than Alternatives A and D but 7 percent more then Alternative C. The benefits to wildlife from fewer open roads would be the greatest in Alternative C (244.3 miles open yearlong). Alternative D (304.8 miles open yearlong) would have 17 percent more open roads than Alternative B, 25 percent more than Alternative C, but 55 percent less than Alternative A.

Bighorn Sheep Management

Domestic sheep and goat grazing can detrimentally affect native bighorn sheep by creating competition for resources and allowing for introduction of diseases into bighorn sheep populations. Alternatives A and D provide the least amount of protection of wild sheep from the effects of domestic sheep and goat allotments and from weed control using domestic sheep and goats because they lack specific buffers between domestic sheep/goat grazing and occupied bighorn sheep habitat. Alternative B would allow no new sheep/goat allotments in occupied bighorn sheep habitat or within a five-mile buffer. Under Alternative B, sheep and goats could not be used for weed control within 2 miles of occupied native sheep habitat. Alternative C offers the greatest protection from disease and competition for resources due to the largest mandatory buffer (nine miles) between bighorn sheep and domestic sheep/goat allotments. Under Alternative C, sheep and goats could not be used for weed control within 4 miles of occupied native sheep habitat.

Big Game Management

Alternative A contains little direction related to road density within important big game areas. No unroaded blocks would be protected as security habitat.

All action alternatives would provide for protecting big game security habitat in forested blocks at least 250 acres in size, with larger sized blocks being considered and addressed during project or watershed-scale planning.

Alternative B would protect more winter range than Alternatives A and D by managing to reduce the road density to 1.0 mile/mi^2 or less in the five site-specific travel plan areas and by allowing no net increase in permanent roads where current road densities are 1 mi/mi^2 or less in winter range. It provides more wildlife corridor in low road density than Alternatives A and D, but less than Alternative C.

Alternative C would have the most improvement to big game winter range by having the lowest road density (road densities in winter range would be 0.8 mi/mi^2 or less in the five site-specific travel plan areas) and by allowing no net increase in permanent roads where road densities are 1.5 mi/mi^2 or less in winter range. It would also provide the most connectivity and least fragmentation of habitat because it provides for the most acres of low road density in wildlife movement corridors.

Alternative D would provide less protection to winter range because more roads would be allowed to remain open in winter range (road densities in winter range would be 1.2 mi/mi^2 or less in the five site-specific travel plan areas) than in Alternatives B and C, but less than in Alternative A. Under Alternative D, winter range would continue to be degraded or lost because net increases in permanent road mileage would be allowed in areas where road densities exceed 0.5 mi/mi^2. Alternative D would provide less connectivity and more fragmentation than Alternatives B and C due to fewer acres of low road density in wildlife movement corridors.

Fish

Alternatives A and D provide some protection for fish and aquatic and riparian habitats through Streamside Management Zones (SMZs). Alternative B provides more protection with Riparian Management Zones (RMZs) where management would be focused primarily on meeting site-specific riparian objectives, including aquatic resource objectives. RMZs under Alternative B would be an average of 160 feet wide for fish-bearing streams (either side of stream), compared to generally 50 foot widths of SMZs in Alternatives A and D. RMZs would be widest under Alternative C (300 feet on either side of fish-bearing streams), providing the most protection to aquatic and riparian habitats for a diversity of species. RMZ widths on perennial non fish-bearing streams would be 80 feet in Alternative B and 150 feet in Alternative C. RMZ widths on intermittent streams would be 50 feet in both Alternatives B and C.

RMZs (Alternatives B and C) would reduce sediment inputs in streams, and provide for more long-term large wood recruitment, more streamside shade and nutrient inputs, and better long-term riparian vegetation health compared to SMZs (Alternatives A and D).

Roads in riparian areas can have effects on fish and aquatic habitat including sedimentation; loss of shade, ground cover, and large wood recruitment due to preclusion of riparian vegetation; and alteration of stream channel morphology due to roads impacting stream channel or floodplain function. Miles of open road within 300 feet of streams were used as an indicator to assess the relative degrees to which these direct and indirect impacts may occur by alternative. Alternative A would likely have the greatest degree of these negative impacts with 94.3 miles of open road within 300 feet of streams. These effects would be less under Alternative B with 77.4 miles of road and less still under Alternative C with 73.7 miles of open road. Alternative D would have the second greatest degree of impact due to its 81.2 miles of open road within 300 feet of streams. Under Alternative A there would be 17.1 miles of closed roads within 300 feet of streams. Alternatives B, C, and D would all reduce these impacts to varying degrees by closing or decommissioning 33.9, 37.6, and 30.2 miles of road within 300 feet of streams, respectively.

Special Status and Priority Wildlife, Fish, and Plants

Wildlife

Alternative A would provide no seasonal buffers for noise/human activity disturbance to raptor nests, or bald eagle roost and nest trees and would have the greatest disturbance due to motorized access. Alternative B would provide a seasonal buffer (from noise and human activity) to occupied (½ mile) raptor nests and reduce motorized disturbance to occupied nest sites more than Alternatives A and D. Alternative C would provide the greatest protection for raptor nests with a 1 mile buffer around occupied nests to protect nests from disturbance and loss of habitat. The buffers would be the smallest (¼ mile for occupied nests) and motorized access reduced the least of the action alternatives under Alternative D.

Alternative A protects the least amount of habitat for grizzly bear by allowing the highest density of open roads within the distribution of grizzly bear and by not limiting the miles of road that could be built in grizzly bear habitat. Alternative B provides more protection for grizzly bears by providing for lower road densities in their habitat (0.8 mi/mi^2 in distribution zone) than Alternatives A and D and reduces the potential for human–bear conflicts. Alternative B also improves and increases habitat for grizzly bear by allowing no net increase in permanent roads in grizzly habitat where the road density is 1 mi/mi^2 or less. Alternative C would protect the most habitat for grizzly bear from loss of habitat and disturbance from open roads by allowing no net increase in permanent roads in grizzly bear distribution area where open road densities are 1.5 mi/mi^2 or less. Alternative C has the most acres benefiting from low road densities, the fewest acres impacted by high road densities and provides the greatest benefit to grizzly bear habitat by reducing fragmentation, protecting larger blocks of habitat and reducing disturbance (road density of 0.6 mi/mi^2 in distribution zone). Of the action alternatives, Alternative D would restore and protect the fewest acres of habitat within the distribution of grizzly bear by allowing more open roads (1.3 mi/mi^2 in distribution zone).

There would be approximately 54,810 acres unavailable for oil and gas leasing under Alternative A. This is more than under Alternatives B (28,774 acres) and D (36,406 acres) but less than under Alternative C (580,382 acres). Alternative A would have No Surface Occupancy on 251,779 acres, which is less than under Alternative B (280,312 acres) but more than Alternatives C (23,903 acres) and D (93,288 acres). Alternative A would have fewer acres protected with timing limitations and controlled surface use (313,694 acres) than Alternative B (325,165 acres) and Alternative D (468,421 acres), but more than Alternative C (47,909 acres). Alternative B would protect the most acres with timing limitations for big game, sage grouse, and raptors and would have more acres under No Surface Occupancy (280,312) than any other alternative. Alternative C would protect the most habitats for all species by not allowing oil and gas leasing on approximately 580,382 acres. Alternative D would protect most species to a lesser degree with controlled surface use and timing limitations.

There would be eight sensitive species given protection under all alternatives with oil and gas stipulations; prairie dog, sage grouse, ferruginous hawks, peregrine falcons, raptor breeding territories, westslope cutthroat trout, Yellowstone cutthroat trout, and Arctic grayling.

Under Alternative A, all sensitive species would be protected with a No Surface Occupancy (NSO) stipulation up to ¼ mile with the exception of sage grouse which would have a smaller area protected around leks and timing restrictions in winter/spring habitat.

Alternatives B and D would have similar stipulations for sensitive species with only four stipulations that differ. Under Alternative D there would be Standard Lease Terms for raptor breeding territories compared to timing restrictions under Alternative B. Ferruginous hawks would be given a timing restriction under Alternative D but a NSO under Alternative B and westslope cutthroat trout, Yellowstone cutthroat trout and Arctic grayling would have a Controlled Surface Use (CSU) stipulation within ½ mile of their habitats with Alternative D but a NSO within ½ mile of their habitats under Alternative B.

Alternative C would provide the most protection of all alternatives to sensitive species with either No Leasing or NSO stipulations throughout most of their habitats.

All federally listed species would be protected in habitats where they are found with a CSU stipulation under all alternatives. The action alternatives would provide additional protection for currently listed and de-listed species (grizzly bear, bald eagle, gray wolf, peregrine falcon, and bull trout) through the use of NSO, timing restrictions or No Leasing. Of the action alternatives, Alternative C would provide the most protection to currently listed species and Alternative B would provide more protection than Alternatives A and D.

Big game habitat and state wildlife management areas would also be protected through the use of oil and gas stipulations. The stipulation for wildlife management areas would be more restrictive under Alternative A than Alternatives B or D but less restrictive than C. Alternatives A, B and C would have the same stipulation for big game winter/spring range (Timing Limitation) but Alternative C would be more restrictive with No Leasing. For elk calving areas, Alternative D would be the least restrictive (Standard Lease Terms) with the stipulation being a Timing Limitation for Alternatives A and B, while Alternative C would be most protective with No Lease in these areas. For bighorn sheep habitat, Alternative C is the most protective (No Lease) of all alternatives while Alternative B (Timing Limitation in Yearlong Range, NSO in Core Areas) is more protective than Alternatives A (Timing Limitation in Yearlong Range) and D (Timing Limitation in Yearlong Range).

Fish

Effects and relative degrees of protection for special status fish would generally be similar to those described in the general Fish section above. Bull trout habitat would be managed under the Interim Bull Trout Habitat Conservation Strategy (USDI BLM 1996a).

Alternative C would protect habitat of genetically pure westslope cutthroat trout and other aquatic and riparian dependant species along approximately 2 miles of stream in the Muskrat Creek drainage through a proposed 180-acre locatable mineral withdrawal. This habitat would not be subject to direct effects from mineral exploration and development under this alternative. Under Alternatives A, B, and D, this protection would not be in place as there would be no mineral withdrawal of these riparian areas.

Oil and gas stipulations would protect special status fish species in affected streams by NSO within ½ mile of streams in Alternative B. Alternative B would also protect streams identified as having high restoration potential for native fish species with a NSO stipulation within ½ mile of these streams. Alternative C would have the greatest amount of protection with NSO or No Lease within ½ mile of streams affected for various species. Alternative D would be less protective than either Alternative B or C with a CSU stipulation within ½ mile of most special status fish species.

Plants

Vegetation treatments in Alternative A would provide less restoration and maintenance of special status plant habitat than Alternatives B and D because fewer acres would be treated. Alternative D would treat the most acres whereas Alternative C would treat the fewest with corresponding effects on habitat. Potential short-term adverse impacts from vegetation treatments due to disturbance or crushing of special status plants would vary similarly to long-term potential benefits by alternative.

Off highway vehicle (OHV) use potentially affects special status plants and habitat through ground disturbance. More OHV use causes greater ground disturbance which can cause direct destruction of plants, and degradation or fragmentation of habitat. Motorized vehicle use can also facilitate increased noxious weed spread, potentially leading to special status plants being outcompeted by noxious weeds. The greatest amount of motorized vehicle use would be with Alternative A while the least amount of motorized use is proposed for Alternative C. Potential impacts on special status plant populations and habitat from motorized vehicle use would be the least for Alternative C and the most for Alternative A while Alternatives B and D fall in between with B having fewer potential impacts than Alternative D.

ISSUE 3: TRAVEL MANAGEMENT AND ACCESS

Travel Management

Alternative A has the greatest number of motorized opportunities and the most acres open to cross-country snowmobile use. User conflicts and the potential for accidents/injuries would be the greatest of all alternatives because motorized and non-motorized users would share the same routes. Road development associated with forest product removal could increase road density.

Wildlife closures would have the fewest short-term impacts on travel and access due to fewer seasonal wildlife closures than other alternatives. Establishment of new permanent roads increasing public access is likely to be more widespread than with any other alternative.

Alternative B (417 miles open yearlong or open w/restrictions) would have less motorized route use opportunities than Alternatives A (629 miles open yearlong or open w/restrictions) and D (479 miles open yearlong or open w/restrictions), but more than with Alternative C (372 miles open yearlong or open w/restrictions). Non-motorized opportunities under Alternative B would be greater than with Alternatives A and D but less than with Alternative C. Cross-country snowmobile use would be less with Alternative B than with either Alternative A or D, but would be greater than with Alternative C. User conflicts, accidents, and injuries would be reduced under Alternative B compared to Alternatives A and D due to more dispersed recreational opportunities. Illegal activities due to the size of the motorized route network may be less under Alternative B than Alternatives A and D, but may still occur more than Alternative C.

Route closures in Alternative C would result in the greatest decrease in motorized use opportunities and highest level of non-motorized opportunities of all alternatives. Cross-country snowmobile use would be the most limited of all alternatives. Potential user conflicts, accidents, and injuries would likely be the least of all alternatives due to the greatest opportunities for motorized and non-motorized uses to be separated.

Alternative D provides the greatest motorized use opportunities and the least non-motorized opportunities of the action alternatives. Non-motorized opportunities would be more than Alternative A but less than Alternatives B and C. Cross-country snowmobile use would be slightly less than with Alternative A but greater than with either Alternatives B or C. Potential user conflicts, accidents, and injuries would likely be greater than with Alternatives B or C, but less than with Alternative A. Illegal activities would likely be less with Alternative D than with Alternative A, but may still occur more than with Alternatives B and C.

Helena Travel Planning Area

In Alternative A (52.2 road miles open yearlong), no non-motorized trails would be designated. Alternative B (9.8 road miles open yearlong) would have decreased opportunities for motorized users and increased opportunities for non-motorized users since, in the Scratchgravel Hills area, wheeled motorized access would be restricted to routes leading to existing trailheads (with the exception of a few routes needed for residential access). Alternative C (7 road miles open yearlong) would provide 5 percent more non-motorized only route opportunities than Alternative B and 85 percent fewer motorized route opportunities than Alternative A. Alternative D (21.9 road miles open yearlong) would have greater opportunities for motorized users than with the other action alternatives because new loop routes would be created in Scratchgravel Hills.

Management costs under Alternative A would be mixed. Less personnel time would be required to monitor user compliance compared to other alternatives; however more effort would be required for signing designated routes than with any other alternative. Alternatives B and C would have increased costs for trailhead maintenance, gates, and signage associated with restricted motorized access. Alternative D would have higher costs than the other action alternatives due to costs for signage and maintenance of more open routes as well as costs associated with constructing new connector routes and reconstructing existing routes.

Under Alternative A, transportation facility costs would be higher than under the action alternatives. Alternative B would cost 81 percent less than Alternative A, Alternative C would cost 87 percent less, and Alternative D would cost 58 percent less.

East Helena Travel Planning Area

Alternative A (36.6 road miles open yearlong, 7.7 miles open w/restrictions) would provide 60 percent more motorized opportunities than Alternatives B (13.7 miles open yearlong) and C (12 miles open yearlong), and 15 percent more than Alternative D (36 miles open yearlong). Non-motorized only opportunities would increase under Alternative B compared to Alternatives A and D. Alternative B would also provide increased opportunities for disabled hunters. Alternative C would provide the least amount of motorized opportunities of all alternatives while providing the most non-motorized opportunities. Alternative D would provide over 55 percent more motorized opportunities than either Alternatives B or C. There would be fewer non-motorized dispersed opportunities with Alternative D than with Alternatives B or C.

Management costs under Alternative A would be mixed. Less personnel time would be required to monitor user compliance than with other alternatives; however more effort would be required for signing designated routes. Costs would increase under Alternatives B and C for new trailhead development, initial signing, and long-term compliance efforts. Costs with Alternative D would be less than with Alternative A, but more than with Alternatives B and C due to initial signing and long-term maintenance and compliance efforts.

Transportation facility maintenance, monitoring, compliance, and weed control costs would be 17 to 269 percent higher under Alternative A than under the action alternatives. Due to the overall reduction in maintained routes, transportation facility costs under Alternative B would be 62 percent less than Alternative A, Alternative C would cost 73 percent less, and Alternative D would cost 14 percent less.

Lewis and Clark County NW Travel Planning Area

Alternative A (57.5 road miles open yearlong, 6.7 miles open w/restrictions) would provide 47 percent more motorized routes than the action alternatives. Non-motorized users would have fewer opportunities under Alternative A. Under Alternative B (13.8 road miles open yearlong, 14.3 miles open w/restrictions) opportunities for non-motorized users would be greater than under Alternatives A and D (19.6 miles open yearlong, 14.5 miles open w/restrictions). Alternative C (8 miles open yearlong, 11.7 miles open w/restrictions) would provide the least opportunities for motorized users and the greatest for non-motorized users. Closure of routes in the northwest corner of TPA would result in enhanced non-motorized opportunities. Alternative D would provide more motorized opportunities than other action alternatives.

Management costs under Alternative A would be mixed. Less personnel time would be required to monitor user compliance than with other alternatives; however more effort would be required for signing designated routes. Costs would increase under Alternatives B and C, for initial signing and long-term compliance efforts. Costs under Alternative D would increase as well due to initial signing and long-term maintenance and compliance efforts.

Transportation facility maintenance, monitoring, compliance, and weed control costs would be 88 to 128 percent higher under Alternative A than under the action alternatives. Due to the overall reduction in maintained routes, transportation facility costs under Alternative B would be 56 percent less than Alternative A, Alternative C would cost 69 percent less, and Alternative D would cost 47 percent less than Alternative A.

Boulder-Jefferson City Travel Planning Area

Alternative A (60.5 road miles open yearlong) would have 37 percent more routes open to motorized use than Alternative D (5.3 miles open yearlong, 32.8 miles open w/restrictions) and approximately 60 percent more than Alternatives B (3.7 miles open yearlong, 25.1 miles open w/restrictions) and C (3 miles open yearlong, 20.5 miles open w/restrictions). In addition, Alternative A would have no designated non-motorized routes, and fewer recreation opportunities for non-motorized users. Alternative B would provide more opportunities for non-motorized users than Alternative A. Alternative C would provide the fewest opportunities for motorized users since it has the least number of open routes. Opportunities for motorized users under Alternative D would be greater than under Alternatives B and C but less than under Alternative A.

Management costs under Alternative A would be mixed. Less personnel time would be required to monitor user compliance than with the other alternatives; however more effort would be required for signing designated routes. Costs would increase under Alternatives B and C for initial signing and long-term compliance efforts. Costs under Alternative D would be less than Alternative A, but more than under Alternatives B and C due to initial signing and long-term maintenance and compliance efforts.

Under Alternative A, transportation facility maintenance, monitoring, compliance and weed control costs would be 59 to 122 percent higher than under the action alternatives. Due to the overall reduction in maintained routes, transportation facility costs under Alternative B would be 55 percent less than with Alternative A, Alternative C would cost 61 percent less and Alternative D would cost 37 percent less than Alternative A.

Upper Big Hole River Travel Planning Area

Alternative A (70.6 road miles open yearlong, 88 miles open w/restrictions) would have at least 38 percent more motorized routes than the other alternatives. Alternative A has the fewest non-motorized opportunities. Alternative B (26.9 miles open yearlong, 57.9 miles open w/restrictions) would reduce by half the motorized opportunities due to seasonal restrictions or road closures and non-motorized opportunities would be enhanced. Alternative C (19.2 miles open yearlong, 40.8 miles open w/restrictions) would provide the fewest opportunities for motorized users and the greatest opportunities for non-motorized users. Alternative D (26.8 miles open yearlong, 70.6 miles open w/restrictions) would provide fewer opportunities for motorized use than Alternative C, but more than Alternatives A and B.

Management costs under Alternative A would be mixed. Less personnel time would be required to monitor user compliance than under the other alternatives; however more effort would be required for signing designated routes. Costs would increase under Alternatives B and C for initial signing and long-term compliance efforts. Costs under Alternative D would be less than under Alternative A, but more than under Alternatives B and C due to initial signing and long-term maintenance and compliance efforts.

Under Alternative A transportation facility maintenance, monitoring, compliance, and weed control costs would be 62 to 163 percent higher than under the action alternatives. Due to the overall reduction in available routes, transportation facility costs under Alternative B would be 49 percent less than under Alternative A, Alternative C would cost 62 percent less, and Alternative D would cost 38 percent less than under Alternative A.

ISSUE 4: RECREATION

User Opportunities

Alternative A provides the most opportunities for motorized users, organized motorized events, boat-in camping, and snowmobile use. Alternative A also provides the fewest non-motorized use opportunities.

Alternative B provides more opportunities than Alternatives A and D for non-motorized users due to its greater number of closed roads. Under Alternative B there would be a reduction in boat-in camping opportunities as these would be limited to developed and designated undeveloped dispersed recreation sites along the Holter and Hauser Lake shorelines.

Alternative C would provide the most opportunities for non-motorized users and the least opportunities for motorized users due to its greatest number of closed roads of all alternatives. Opportunities for organized motorized events would be eliminated under Alternative C. Dispersed camping at Holter and Hauser Lakes would be reduced to the greatest extent due to closing of the entire shorelines to boat-in camping except at developed sites.

Alternative D would provide greater motorized and lower non-motorized use opportunities than either Alternative B or C. Alternative D would limit organized motorized events to non-competitive activities in the Pipestone area only. Boat-in camping opportunities would be the same as Alternative A.

User Conflicts and Violations

Alternative A would impose the fewest management measures on motorized and non-motorized users within the Scratchgravel Hills and therefore motorized travel violations, user conflicts and illegal activities would likely be greater than with any other alternative. Alternatives B and C would have the greatest potential to reduce conflicts and violations compared to Alternatives A and D in the Scratchgravel Hills due to restricted motorized access and dusk to dawn closure (Alternative C). These effects under Alternative D would likely be slightly less than under Alternative A but greater than under Alternatives B and C.

Recreation Opportunity Spectrum

Alternative A could have negative impacts on recreation uses and experiences because there would be no ROS classifications. Management would be reactive rather than proactive. Alternative B would provide a balanced approach for managing recreation settings, opportunities and experiences compared to Alternatives C and D. Alternative C would provide the most acreage designated as ROS Semi-Primitive Non-Motorized creating the greatest non-motorized and the least motorized opportunities. Alternative D would manage 90 percent of the Decision Area under ROS settings allowing varying degrees of motorized activity.

Issue 5: Special Designations including ACEC, National Trails, Wild and Scenic Rivers and WSAs

Areas of Critical Environmental Concern

Under Alternative A the existing ACEC (Sleeping Giant, 11,679 acres) would be the only area managed as an ACEC. In Alternative B, four areas (70,644 acres) would be managed as ACECs, while five ACECs (87,893 acres) would be designated under Alternative C. Alternative D would manage the least amount of acreage as ACECs (23,695 acres) of the action alternatives.

National Trails

The Continental Divide Trail (CDT) and the Lewis and Clark Historic Trail (L&CHT) would be managed cooperatively with the USFS and the NPS respectively, in accordance with national policy guidelines under all alternatives. BLM would also continue managing the L&CHT with other established partners to promote collaborative planning under the Missouri/Madison Comprehensive Recreation Plan. Under the action alternatives, the two trails would be managed in accordance with final ROS, VRM, travel plan and other resource/resource use decisions. In addition BLM would coordinate with the FS to evaluate opportunities to reroute the CDT segment to enhance user experiences and reduce future needs for easements and/or acquisitions.

Wild and Scenic Rivers

Suitability studies for the four eligible river segments (Upper Big Hole River – 2.3 miles, Upper Missouri River – 3.1 miles, Moose Creek – 4.0 miles and Muskrat Creek – 2.6 miles) would not be completed and protective management would continue indefinitely for these segments under Alternative A. Under Alternative B, Muskrat Creek would be recommended as suitable and the Upper Missouri River segment would be recommended preliminarily suitable pending concurrence by the USFS (Helena National Forest) for inclusion in the NWSRS; interim protective management would continue for these two segments. The remaining segments, Upper Big Hole River and Moose Creek, would be identified as non-suitable. Alternative C provides the greatest protection for the four eligible river segments as they would all be recommended as suitable for Congressional designation. Alternative D provides the least protection for these eligible segments as all would be identified as non-suitable, and interim protective management would be discontinued.

Wilderness Study Areas

Under all alternatives, all six WSAs (Humbug Spires, Sleeping Giant, Sheep Creek, Black Sage, Elkhorn Tack-on, and the Yellowstone River Island) would continue to be managed under the Interim Management Policy and Guidelines for Lands under Wilderness Review until Congress either designates them as wilderness or releases them from further review. Under the action alternatives, Sleeping Giant, Sheep Creek, Humbug Spires and the Elkhorns Tack-on WSAs would be managed as ACECs should Congress release them from wilderness consideration. Should Congress release Black Sage and the Yellowstone River Island then they would be managed under the general guidelines established under each alternative.

PREFERRED ALTERNATIVE

At the time of publication of the Proposed RMP/Final EIS, Alternative B has been modified from the Draft RMP/EIS and is the preferred alternative.

CHAPTER 1
INTRODUCTION

CHAPTER 1
PURPOSE AND NEED

OVERVIEW

The United States Department of the Interior (DOI), Bureau of Land Management (BLM) has prepared this revision of the Resource Management Plan (RMP) to provide direction for managing public lands under the jurisdiction of the Butte Field Office in mid-western Montana and an environmental impact statement (EIS) to analyze the environmental effects that could result. The affected lands are currently being managed under two plans: the Headwaters Resource Management Plan (USDI-BLM 1983) and the Dillon Management Framework Plan (MFP) (USDI-BLM 1979). The Headwaters RMP has been formally amended on eight occasions and the Dillon MFP has been formally amended on three occasions. In addition, several new laws, regulations, and policies have affected management of public land since approval of both plans. For lands administered by the Butte Field Office, this RMP revision will replace the Headwaters RMP and the Dillon MFP.

Land use planning is used to manage resources and to designate uses on public lands in coordination with tribal, state, and local governments, land users, and interested public. This RMP: 1) incorporates new information about resources and resource uses, and regulatory guidance that has come into existence since establishment of the Headwaters RMP and Dillon MFP over 20 years ago, and 2) provides management direction where it may be lacking or requires clarification. Current management direction that has proven effective and requires no change will be carried forward into the revised RMP.

The RMP is being revised according to guidance in the Federal Land Policy and Management Act (FLPMA) of 1976 (43 US Code [USC] 1701 et seq.) and BLM's Land Use Planning Handbook, H-1601-1 (USDI-BLM 2005a). An EIS is incorporated into this document as required by the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508) (CEQ 1978), and requirements of BLM's NEPA Handbook, H-1790-1 (USDI-BLM 2008a).

PURPOSE OF AND NEED FOR REVISING THE PLAN

The purpose of the RMP is to provide a single, comprehensive land use plan to guide management of public lands administered by the Butte Field Office. The plan provides goals, objectives, land use allocations, and management direction to maintain, improve, or restore resource conditions and to provide for the long-term economic needs of local communities.

Since the original plans were approved, several conditions have changed. These include:

- Changed ecological, socioeconomic, institutional, and regulatory conditions;
- Many new laws, regulations, and policies that invalidate or superseded previous decisions;
- Changing user demands and activities;
- Changing acceptance of impacts; and
- Changes in the Butte Field Office boundaries.

These conditions drive the need for an inclusive, comprehensive plan that provides updated, clear direction to both BLM and the public.

The purpose of site-specific travel planning is to develop travel plans that meet the needs of public and administrative access, are financially affordable to maintain, and minimize user conflicts and natural resource impacts associated with roads and trails, largely as per 43 CFR 8342. There is a need to do this because in many portions of the BFO, travel planning has not ever been conducted in a manner to establish a managed transportation network that meets these regulations and fully considers public and administrative needs, user conflicts, and natural resource impacts.

Planning for the management of BLM-administered lands is a tiered process. Documents produced during each successive tier are progressively more focused in scope and more detailed in terms of their identification of specific measures to be undertaken and impacts that may occur. The four tiers are described briefly below:

The RMP provides an overall vision of the future (goals and objectives) and includes measurable steps, management actions, and allowable uses to achieve the vision.

Subsequent implementation decisions are carried out by developing activity-level or project-specific plans. Activity-level plans usually describe multiple projects for a single or multiple resource programs. Project-specific plans usually describe a single project or several related projects.

The RMP provides basic program direction with the establishment of goals, objectives, allowable uses, and management actions or prescriptions. The RMP focuses on what resource conditions, uses, and visitor experiences should be achieved and maintained over time. To do this, the RMP must take a long-term view.

Planning Area is all the land within the Butte Field Office administrative boundary regardless of jurisdiction.

Decision Area is comprised of only those lands administered by the BLM (surface and mineral estate).

Defining planning issues and planning criteria represent the first steps in establishing the scope of the RMP revision. These, combined with public input, provide the framework in which RMP decisions are made. RMP decisions refer to what is established or determined by the final RMP. The RMP provides guidance for land use planning decisions in accordance with the following categories:

- Natural, biological, and heritage resources
- Resource uses
- Special designations such as Areas of Critical Environmental Concern and Wild and Scenic Rivers.

In the context of these categories, the planning team develops management strategies aimed at providing viable options to address planning issues. These management strategies provide the basis for future activity-level plans or specific projects.

In addition to the RMP type decisions described above, several implementation decisions associated with activity plans for several site-specific travel plans will be made based on this document. Travel route-specific management decisions will be made for the following five Travel Planning Areas (TPAs): Helena, East Helena, Lewis and Clark County Northwest, Upper Big Hole, and Boulder/Jefferson City.

DESCRIPTION OF THE PLANNING AREA

The Butte Field Office administrative area is located in mid-western Montana (**Map 1**). The Planning Area is all the land within the Butte Field Office administrative boundary. Within the Planning Area, BLM administers about 307,300 acres of public land surface and 652,200 acres of federal mineral estate in Broadwater, Deer Lodge, Gallatin, Jefferson, Lewis and Clark (southern portion), Silver Bow, Park, and the northern portion of Beaverhead County. **Table 1-1** identifies BLM-administered acres and total acres within the Planning Area by county. Collectively, the lands that BLM administers (surface and mineral estate) are considered the "Decision Area". Surface lands within the Planning Area administered by other federal agencies, such as the U.S. Department of Agriculture, Forest Service (USFS), and U.S. Department of the Army are not subject to decisions made in association with this RMP. Approximately 1,800 acres of land administered by the Bureau of Reclamation surrounding Canyon Ferry Lake near Townsend; 65,500 acres of land administered by the State of Montana including several wildlife management areas, and approximately 277,585 acres of private land for which the BLM holds subsurface mineral rights are also subject to fluid mineral leasing decisions in this document.

Table 1-1
Lands Within the Butte Planning Area

County	BLM Surface Acres	BLM Mineral Estate	County Acres in Planning Area
Beaverhead	12,660	22,372	31,429
Broadwater	70,679	106,032	792,866
Deer Lodge	5,227	141,648	473,932
Gallatin	7,250	34,656	1,683,558
Jefferson	94,397	116,161	1,061,462
Lewis & Clark	63,510	113,119	895,925
Park	8,365	53,505	1,793,054
Silver Bow	45,221	64,701	460,124
TOTALS	**307,309**	**652,194**	**7,192,349**

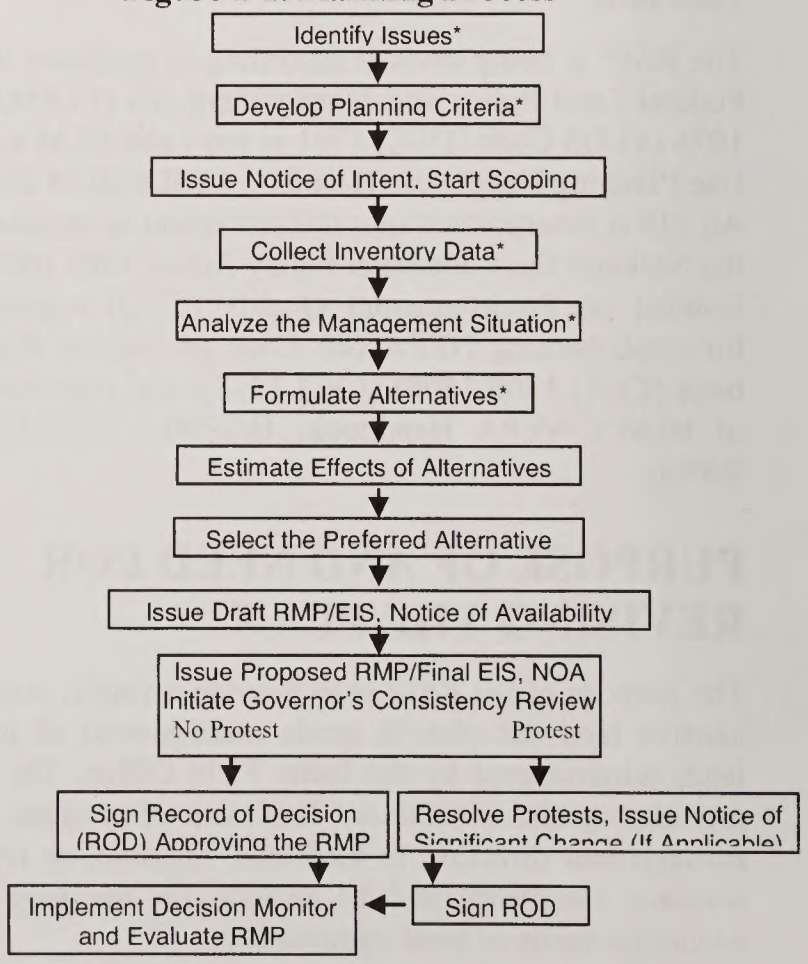
The Decision Area consists of many tracts ranging in size from less than one acre to over 20,000 acres. BLM-administered lands are mixed among private, State of Montana, Bureau of Reclamation, and USFS-administered lands, each of which may be influenced or directly affected by BLM decisions.

The BLM will coordinate with other federal and state agencies, especially for those resources and issues that share boundaries.

PLANNING PROCESS

The planning process involves public participation, assessment, decision-making, implementation, plan monitoring, and evaluation, as well as adjustment through maintenance, amendment, and revision. This process ensures that land use plans and implementation decision remain consistent with applicable laws, regulations, orders, and policies. The steps of RMP preparation are interrelated as illustrated in **Figure 1-1** and **Table 1-2.**

Figure 1-1. Planning Process



* These steps may be revisited throughout the process.



Map shows the state of Montana with the location of the Butte Field Office Planning Area boundary in southwestern Montana.

This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.

Map Scale 1:4,000,000

0 100 Miles

Albers Equal Area, NAD83 Projection

Map generated by the Butte Field Office in February 2007

Map 1: Project Location Map

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Butte Field Office
Proposed RMP/Final EIS

Table 1-2
Steps in the BLM Land Use Planning Process

Step	Process
Step 1 – Identification of Issues	This planning step is designed to identify major problems, concerns, or opportunities associated with the management of public land in the Planning Area. Issues are identified by the public, the BLM, and other governmental entities. The planning process is then focused on resolving the planning issues.
Step 2 – Development of Planning Criteria	Planning criteria are identified to guide development of the RMP and prevent the collection of unnecessary information and data.
Step 3 – Collect and Compile Inventory Data	This planning step involves the collation and collection of various kinds of environmental, social, economic, resource, and institutional data. In most cases, this process is limited to information needed to address the issues. The data required for land use planning decisions is usually at a broader scale than data required in implementation level planning and analyses.
Step 4 – Analysis of the Management Situation	This step calls for the deliberate assessment of the current situation. It identifies the way lands and activities are currently managed in the Planning Area, describes conditions and trends across the Planning Area, identifies problems and concerns resulting from the current management, and identifies opportunities to manage these lands differently. It also forms the basis for the "No Action" alternative.
Step 5 – Formulate Alternatives	During this step, BLM formulates a reasonable range of alternatives for managing resources in the planning area. Alternatives include a continuation of current management (no action) alternative and other alternatives that strive to resolve the major planning issues while emphasizing different management scenarios. Alternatives usually vary by the amounts of resource production or protection that would be allowed, or in the emphasis of one program area over another.
Step 6 – Estimation of Effects	This step involves estimating the physical, biological, economic, and social effects of implementing each alternative in order to provide a comparative evaluation of impacts in compliance with CEQ regulations for implementing NEPA (40 CFR 1500).
Step 7 – Selection of Preferred Alternative	Based on the information resulting from the estimation of effects, the BLM identifies a Preferred Alternative. The Draft RMP/EIS is then prepared for printing and distributed for a 90 day public review.
Step 8 – Selection of RMP	Following review and analysis of public comments on the Draft RMP/EIS, BLM makes adjustments as warranted and selects a proposed RMP. The Proposed RMP and a Final EIS is then published. A final decision is made after a 60-day Governor's Consistency Review and a 30-day public protest period are completed. BLM then publishes the Record of Decision (ROD) and prepares the Approved Resource Management Plan.
Step 9 – Monitoring and Evaluation	This step involves the collection and analysis of resource condition and trend data to determine the effectiveness of the plan in resolving the identified issues and achieving desired results. Implementation of decisions requiring subsequent action is also monitored. Monitoring continues from the time the RMP is adopted until changing conditions require revision of the whole plan or any portion of it.

SCOPING AND PLANNING ISSUES

SCOPING PROCESS

Early in the planning process, the public was invited to identify planning issues and concerns relating to the management of BLM-administered public lands and resources/uses in the Planning Area. The formal scoping period began with publication of the Notice of Intent (NOI) in the Federal Register on December 19, 2003. The scoping period ended February 17, 2004, which provided 60 days for comment submittal.

The Butte RMP website housed current information including background documents, maps, meeting announcements, published bulletins, and other documents (http://www.blm.gov/mt/en/fo/butte_field_office.html). After April 2005 the BLM was required to take the website down and it was unavailable until approximately January 2006.Scoping information and newsletters were sent to a list of individuals, agencies, and organizations compiled including those who participated in past BLM events, those who requested to be on the mailing list, or

individuals who participated in the scoping meetings or submitted a comment.

Advertisements were published in Montana newspapers and a press release was sent to newspapers, radio stations, and television stations to: notify the public of the project, announce six public open houses, request public comments, and provide contact information for the BLM.

Six public meetings were held in January 2004. **Table 1-3** illustrates the attendance at each scoping meeting. At the six scoping meetings, 37 people registered their attendance. Comment forms were available at the six scoping meetings to collect comments. No written comments were received during the public meetings; however, verbal comments were offered and recorded.

Table 1-3
Scoping Meeting Summary

Meeting Location	Meeting Date	Attendance
Helena, MT	January 6, 2004	7
Boulder, MT	January 8, 2004	2
Wise River/Divide, MT	January 13, 2004	6
Butte, MT	January 13, 2004	14
Bozeman, MT	January 14, 2004	4
Townsend, MT	January 15, 2004	4

Representatives from the Butte Field Office also met with several groups during the scoping period, including County Commissioners (Lewis and Clark, Silver Bow, Broadwater, Deer Lodge, and Jefferson counties); the Big Hole Watershed Committee, the Western Montana Resource Advisory Council; American Wildlands; and the East Pioneers Stewardship Group.

During initial scoping, the public submitted a total of 17 responses containing 554 comments.

Proposed Planning Scenario

Using comments received during the initial scoping period, the BLM interdisciplinary team developed the "Proposed Planning Scenario", which describes possible management prescriptions and goals for individual programs. The Proposed Planning Scenario (PPS) was distributed on June 6, 2005 to gather public and agency comment on issues and concerns regarding the plan. The comment period closed July 6, 2005. Comments on the PPS were contained in 34 written letters, which included 691 specific individual comments that were considered during development of RMP alternatives.

On August 10, 2005, the PPS was sent to tribal governments, local, state, and federal agencies asking them to comment. The deadline for these comments was September 6, 2005. No comments were received.

Public meetings were held on the PPS, June 9, 2005 in Helena and June 13 and 29, 2005 in Butte. These meetings were attended by a total of about 30 people. Public comment forms were provided at the meetings. Few comments were received at the public meetings. Most comments were subsequently received in writing during the comment period.

In an effort to solicit more public feedback on the RMP, 29 organizations or groups were contacted and offered BLM briefings on the PPS. Of those, 10 requested briefings. The briefings were held during June and July 2005. Of the ten organizations that received briefings, six were county commissions, the remainders were advocacy groups.

Travel Management Planning

Travel management and access is addressed at two levels in this document. Proposed management is described at the Field Office level as part of the RMP decision to be made. In addition, there are five Travel Planning Areas for which site-specific management by individual travel routes is proposed by alternative. Site-specific travel plan decisions for each of these five areas will be made separately from the RMP level decisions as implementation type decisions.

Five public meetings were held over a two-week period in November and December 2004. Separate meetings were held specific to each of the five following Travel Planning Areas: Upper Big Hole, Boulder/Jefferson City, East Helena (North Hills), Lewis and Clark County Northwest (Marysville) and Helena (Scratchgravel Hills). To advertise the meetings, BLM sent a mailer to all people on its mailing list and advertised the meetings on its public website. In addition, BLM sent a press release to the appropriate newspapers, radio stations, and television stations announcing the meetings. Table 1-4 presents a summary of attendance at the five meetings.

A formal presentation was given by the Butte Field Office management. After the presentation the participants were asked to state issues and concerns and proposed solutions before the group. Participants were also encouraged to submit written comments which were

Table 1-4
Travel Planning Meeting Summary

TPA	Meeting Date	Attendance
Upper Big Hole	November 15, 2004 November 3, 2005	4 11
Boulder/Jefferson City	November 16, 2004	7
East Helena	November 30, 2004	24
Helena	December 1, 2004	101
Lewis and Clark Co. NW	December 2, 2004	16

used to formulate the alternatives for travel management in these areas.

Two additional public meetings (one in Divide, the other in Butte) were held on November 3, 2005, to scope public feedback on the Upper Big Hole Travel Planning Area. A total of 11 people attended these meetings.

Working Group Proposal Development

BLM initiated *community based collaborative working groups* (comprised of non-BLM personnel and sponsored/overseen by Lewis and Clark County) in an effort to help BLM develop site-specific travel management alternatives agreeable to the public as well as the agency. Refer to **Appendix A – Travel Planning** for further details on the working group process. Additional information on this topic can be found in Chapter 5.

PLANNING ISSUES

Planning issues were identified through an extensive review of the Dillon MFP (1979), Headwaters RMP (1984), and associated amendments and decision documents. This resulted in the Butte RMP Preparation Plan, which identified land management direction that could be carried forward, and management direction that needed to be changed (see the Purpose and Need section above).

Public comments were reviewed, categorized, and analyzed to identify specific planning issues and concerns to be addressed in the Butte RMP.

Planning issues and management concerns identified and the land management direction to be developed in the Butte RMP are described in **Table 1-5** (page 9).

Issue Identification

Issue identification is the first step of the nine-step BLM planning process (see Planning Process below). A planning issue is a major controversy or dispute regarding management of resources or uses. These issues drive the formulation of the range of alternatives considered in this EIS.

The criteria used to identify issues included identifying if the effects:

- Would approach or exceed standards or a threshold.
- Would substantially change a resource.
- Would be controversial.
- Would offer a wide range of opportunities.
- Would cause disagreement regarding their environmental impact.

Analysis of the public comments was completed and a Scoping Summary Report finalized in September 2005 (USDI-BLM 2005b). After consideration of public responses, 5 major planning issues and 12 management concerns were identified. These issues and management concerns were used to develop alternatives.

Issue 1: Vegetation Communities

How will vegetation on BLM lands be managed to achieve healthy ecosystems while providing for a broad range of multiple uses?

This issue highlights concerns over management of vegetation resources and communities. There is considerable interest in insuring that vegetation management provides a range of commodity uses such as timber and other forest products, and livestock grazing, while maintaining or restoring vegetative communities to provide other resource values such as high quality wildlife and aquatic habitats.

Ecosystems within the Planning Area have evolved over time in response to periodic fire disturbance, and sustainable ecosystems are those that are in balance with the inherent frequency, size, and severity of the natural disturbance cycle. Many acres in the Decision Area have missed one or two fire disturbance cycles due to long-term fire suppression efforts. The vegetative response to this lack of fire disturbance is a change in species presence or prominence, and fuel quantity and continuity.

Management of noxious weeds and other non-native, invasive species is a critical part of public land management. Noxious weeds are one of the largest threats to maintaining and restoring ecosystem health because they usually spread aggressively and have a history of substantial negative impacts on soils, water, habitat, wildlife, and fire cycles. They can also affect local economies with regard to recreation, grazing, forestry, and mining activities.

Issue 2: Wildlife, Wildlife Habitat, Special Status and Priority Plant and Animal Species

How will BLM lands be managed to provide wildlife and fish habitat, and to conserve and recover special status and priority species?

The RMP will focus on a multi-species, ecosystem approach to managing habitat for wildlife, fish, and special status plants and animals. There is a need to protect habitat for viable populations of all native species, manage habitat at scales large enough to accommodate natural disturbances such as fire, wind, and insect outbreaks, provide diversity of vegetative communities, and manage human uses in a manner that conserves and enhances ecological processes. Areas where restoration activities could restore or enhance terrestrial and aquatic habitat will also be identified.

Special status species include species that are listed, proposed for listing, or are candidate species under the Endangered Species Act; and sensitive species identified by BLM. BFO lands provide habitat for species listed as threatened or endangered under the Endangered Species Act (ESA), including the Ute ladies' tresses, Canada

lynx, grizzly bear, bull trout, and three species that have been de-listed under the ESA, the peregrine falcon, bald eagle, and gray wolf. In addition, the area provides habitat for 45 "sensitive species" identified by the BLM. Sensitive species are those for which BLM must manage in a manner to minimize the risk of a future federal listing under the ESA. The RMP will identify strategies that contribute to conservation and recovery of special status species in the PA in consultation with the U.S. Fish and Wildlife Service as required under the ESA for listed species.

Issue 3: Travel Management and Access

How should the BLM manage motorized public travel to meet the needs for public access and resource uses while minimizing user conflicts and impacts to air, soil, watershed, vegetation, wildlife, and other resource values?

Travel and access considerations are of major importance to hunters, off-highway recreationists, livestock grazers, miners, wildlife advocates, non-motorized recreationists, and others.

Travel and access issues are driven by the need to manage for the use and enjoyment of the public lands while protecting resource values and providing user safety. Travel management also involves the need to adequately address increased conflict between motorized and non-motorized users, particularly at urban/rural interfaces.

RMP alternatives for five Travel Planning Areas (TPAs) were developed in consideration of the public's interest and demand for motorized as well as non-motorized travel opportunities while minimizing and/or mitigating resource impacts and user conflicts.

Issue 4: Recreation

How should recreation be managed to accommodate the full range of recreational uses enjoyed by the public on BLM lands?

This issue focuses on the need to set direction for recreation management in light of: increased demands on developed recreations sites and the need for new strategies to improve management efficiency, appropriate services and facilities, and public experiences; the need for management of Special Use Permits to better protect natural resources, minimize user conflicts, provide for needed opportunities and ensure fair value returns for both the permittee and BLM; and the need to classify recreation settings using the Recreational Opportunity Spectrum (ROS) system and modify existing Special Recreation Management Areas to provide a wide range of appropriate activities that foster beneficial experiences for the public.

Issue 5: Special Designations including Areas of Critical Environmental Concern (ACECs), National Trails, Wild and Scenic Rivers, and Wilderness Study Areas (WSAs)

Which areas, if any, should be managed as special designations? How should they be managed to protect values that warrant their special designation status?

In the Butte RMP process, nine nominated areas were reviewed for ACEC designation. In order to qualify as potential ACECs, nominated areas must meet relevance and importance criteria that are established in regulation and in BLM guidance. Five areas met the relevance and importance criteria and are being considered in the RMP. Inclusion of particular potential ACECs within specific alternatives was based in part on the focus of the alternatives.

Concerns with ACEC designation revolve around limitations that special management might place on current and future uses. Proponents of ACEC designation see it as a way of preventing loss of or impact to values of particular interest.

FLPMA states that priority should be given to the designation and protection of these areas when developing land use plans. A potential ACEC is designated in the approved RMP if it requires special management to protect its relevant and important values. Management is considered special if it is outside of the ordinary or routine requirements of the BLM or if it is not covered by provisions already stipulated in the RMP; special management is unique to the area and includes terms and conditions specifically designed to protect the values in the ACEC.

Each of the five potential ACECs have been proposed for designation in at least one alternative in accordance with ACEC guidance found in BLM Manual 1613 (USDI-BLM 1980a).

The RMP also provides protective strategies and appropriate uses for the management of National Trails to protect their resource values and characteristics.

The approved RMP will determine whether any rivers in the Planning Area are recommended as suitable for inclusion in the National Wild and Scenic River system. Four river segments were assessed as to whether they would be suitable for designation under the Wild and Scenic Rivers Act of 1968. Recommendations were incorporated into the plan alternatives.

Six Wilderness Study Areas (WSAs) are located within the Butte Field Office. RMP alternatives consider management options for WSAs that would take effect if Congress releases them from wilderness consideration.

Management Concerns

Management concerns are topics that involve a resource, resource management activity, or land use that generally do not have enough controversy surrounding them to generate different RMP alternatives to address them. While these concerns are addressed in the plan, management related to them may or may not vary by alternative. Concerns were raised outside of the issues described above. These are described below.

Air Quality

This management concern is driven by the need to identify area-wide standards that apply to activities authorized by the Butte Field Office that might affect air quality. Yellowstone National Park is a Federal Class I airshed, and a portion of Silver Bow County is a nonattainment area. These could be affected by activities authorized under the plan.

Air quality concerns include public health impacts from wildland and prescribed fires. The U.S. Environmental Protection Agency (EPA) recommends following the Interim Air Quality Policy on Wildland and Prescribed Fires (May 15, 1998) to assure that an air quality analysis is completed for prescribed burns.

Soil

This management concern focuses on the need to reduce accelerated soil erosion and compaction from occurring within the Decision Area and the potential impacts on soil productivity and other resources.

Off-highway vehicle (OHV) use has created new roads and trails in areas with steep terrain, causing accelerated soil erosion. Other roads and trails have been constructed to a new standard and these disturbances create areas with some short-term and potential long-term soil erosion. In some places, historic cattle grazing has impacted soil and caused localized soil erosion and compaction. The spread of noxious weeds and conifer encroachment may have also had a detrimental effect on soils.

Water Resources

Management concerns associated with water resources involve preventing water quality degradation and improving watershed function to support beneficial uses. Additional concerns stem from water rights issues including management of existing water rights and acquiring water rights when feasible and with willing holders where acquisition of the water right meets a management objective or need.

Over the next decade, several total maximum daily load (TMDL) plans (restoration plans for water quality impaired streams) will be developed by the State of Montana. This will result in new water quality goals intended to improve water quality where beneficial uses are impaired.

Cultural Resources, Traditional Cultural Properties and Paleontological Resources

Management concerns include compliance with new laws, guidelines, and directives to ensure that significant cultural, traditional, and paleontological resources are identified and evaluated prior to surface disturbing activities to ensure protection of resources through appropriate mitigation. The alternatives present options for inventory of archeological and historical sites, coordination with tribal governments to identify religious or traditional lifeway values, education and public outreach programs, mitigation of cultural sites, maintenance of historic buildings, and mapping of fossil localities.

Visual Resources

Management concerns focus on the need to establish Visual Resource Management (VRM) Classifications to guide the management of public land based on scenic quality, sensitivity levels, and distance zones.

Lands and Realty

Management concerns for lands and realty focus on establishing conditions for disposal, retention, or acquisition of land or interests in land. Utility corridors would be designated where placement of future utility facilities would be encouraged. Another concern is the need to develop criteria to assess the impacts of land disposal and acquisition when considering land tenure adjustments.

Minerals and Energy

Management concerns associated with minerals and energy include development of a consistent approach to recognition of mineral rights under the General Mining Law and mineral leasing acts to identify the need for environmentally acceptable exploration, development, and production. The BLM Energy and Non-Energy Mineral Policy, which references several existing acts, recognizes the nation's need for domestic sources of minerals, energy, and other resources and the responsibilities concerning the discovery, development, production and acquisition of minerals and metals. The RMP alternatives provide management options for leasable, saleable, and locatable minerals. These management policies will ensure that federal minerals are available for national economic and energy needs.

Abandoned Mine Lands

Management concerns associated with Abandoned Mine Lands (AML) sites include: the threats posed to human health and the environment from contaminated water, acid rock drainage, or airborne contamination from mine or smelter sites; and public safety issues related to hazardous mine openings such as adits, shafts, open pits, and subsidence over buried mine openings. RMP alternatives incorporate information in accordance with bureau policy to guide the elimination or reduction of physical hazards and safety issues on public lands.

Hazardous Material Management

Management concerns associated with hazardous material management consist of the need to protect employees, the public, and the environment from exposure to hazardous materials in public facilities or on public land. The RMP alternatives comply with all appropriate laws and regulations regarding hazardous material management.

Social and Economic Environment

The Planning Area includes land within eight counties, and near many communities ranging from small cities like Butte and Helena to towns such as Townsend, Whitehall, and Boulder. The concerns among residents and the impacts to communities from public land management decisions vary.

Management concerns associated with the social and economic environment focus on changes to recreation, forestry, mining, livestock grazing, and other land-uses as a result of increased population, economic growth, and continuing development in the Planning Area.

Environmental Justice

Management concerns associated with environmental justice focus on the requirement that BLM evaluate and disclose whether actions would place a disproportionate share of negative environmental consequence on populations covered by Executive Order 12898.

Tribal Treaty Rights including Native American Religious Concerns

Management concerns focus on the requirement to notify and consult with appropriate Native American tribes on BLM authorized actions.

Table 1-5
Description of Planning Issues/Management Concerns, their Desired Future Conditions/Visions, and Management Goals

Issue or Management Concern	Description of Desired Future Conditions/Visions and Management Goals
Issue 1: Vegetation Communities	The desired future condition is for vegetation to fall within the historic range of variability, with diverse, site-appropriate plant communities that contain healthy populations for native species. Management direction is needed to: 1) maintain and/or improve ecological health of woodland communities for sustainability and diversity; 2) manage dry forest types to contain healthy stands of site-appropriate species; 3) manage moist forest types to contain healthy stands that combine into a diversity of age classes and structure; 4) manage old forest structures in a sustainable manner; 5) minimize infestations of invasive plants and noxious weeds; 6) manage upland vegetation communities by including a full range of herbaceous and shrub species; 7) maintain or enhance communities in priority habitats to provide desired ecological functions and values; 8) manage riparian and wetland communities for the appropriate composition, density and age structure; and, 9) manage wetland and riparian habitats to support healthy, diverse and abundant populations of fish and associated aquatic and riparian dependent species. Management direction for forests and woodlands is needed to: 1) restore and/or maintain the health and productivity of public forests to provide a balance of forest and woodland resource benefits to present and future generations; and, 2) manage forestry resources to provide a sustained flow of local economic benefits and protect non-market economic values. Management direction for livestock grazing is needed to: 1) maintain, restore, or enhance BLM rangelands to meet the Land Health Standards; and, 2) manage livestock grazing to provide a sustained level of local economic benefits and protect non-market economic values. Direction for wildland fire management is needed to: 1) provide an appropriate management response to all wildland fires, emphasizing firefighter and public safety; 2) move toward restoring and maintaining desired ecological conditions consistent with appropriate fire regimes; 3) minimize the adverse effects of fire on resources, resource uses and Wildland Urban Interface areas; 4) promote seamless fire management planning across jurisdictions within the boundaries of the Butte Field Office; and, 5) protect life and property by treating hazardous fuels on BLM lands near Wildland Urban Interface areas.

Table 1-5
Description of Planning Issues/Management Concerns, their Desired Future Conditions/Visions, and Management Goals

Issue or Management Concern	Description of Desired Future Conditions/Visions and Management Goals
Issue 2: Wildlife, Wildlife Habitat, Special Status and Priority Plant and Animal Species	The desired future condition is for BLM lands to provide a diverse landscape with native vegetation communities that provide suitable habitat to maintain viable and well distributed populations of native wildlife species on public land. Management direction is needed to: 1) conserve, enhance, restore, or contribute to the recovery of threatened, endangered, or candidate plant or animal species; 2) conserve or enhance habitat of BLM sensitive plant and animal species to prevent the federal listing of these species; 3) conserve special-status species and habitats across the landscape through collaboration and cooperation; 4) provide a variety of well-distributed diverse plant communities to support a diversity of habitats; 5) conserve, enhance, or restore areas of important wildlife habitat such as rare or limited seasonal habitats, corridors, blocks of intact functional habitat across the landscape, areas of low road-density, foraging areas, and riparian areas; and, 6) conserve, enhance or restore special habitat features or mitigate/minimize impacts to special habitat features including, but not limited to caves, cliffs, riparian areas, wetlands, snags, and down woody material.
Issue 3: Travel Management and Access	The vision is to provide a range of quality motorized and non-motorized opportunities, and reasonable access for management while protecting natural resources, now and in the future. Management direction is needed to: 1) provide a balanced approach to travel management that provides a sustained flow of local economic benefits, minimizes or mitigates user conflicts, safety concerns, and resource impacts while taking into consideration the unique attributes of the various travel management Planning Areas; and, 2) maintain facilities, roads and trails to provide for public and/or administrative use and safety while mitigating impacts to resources.
Issue 4: Recreation	The vision is to provide a range of quality recreation opportunities, services, and appropriate facilities for public use and enjoyment. Management direction is needed to: 1) provide a diverse array of recreational opportunities while maintaining healthy public land resources; 2) establish, manage and maintain quality recreation sites and facilities to meet a broad range of public needs subject to resource constraints; 3) manage commercial, competitive or special events with special recreation permits that eliminate or mitigate impacts to resources and conflicts with other users; and, 4) manage recreation opportunities to provide a sustained flow of local economic benefits and protect non-market economic values.
Issue 5: Special Designations including ACEC, National Trails, Wild and Scenic Rivers and WSAs	The vision is to protect relevant and important ACEC values and manage for appropriate uses; protect established National Trail values and manage for appropriate uses; protect Outstandingly Remarkable Values in Wild and Scenic River-eligible river segments and manage for appropriate uses; protect wilderness characteristics in Wilderness Study Areas. Management direction is needed to: 1) designate ACECs where special management attention is required to protect relevant and important values; 2) manage National Trails to promote public enjoyment and protect their designated values; 3) manage preliminarily eligible river segments so that their suitability for potential National Wild and Scenic Rivers System designation is not impaired; and 4) manage WSAs so that their suitability for potential wilderness designation is not impaired.
Air Quality	The desired future condition is for air quality to be maintained in a condition that protects human health and the environment. Management direction is needed to ensure BLM authorizations and management activities protect the local quality of life and sustain economic benefits by complying with tribal, local, state, and federal air quality regulations, requirements and implementation plans.

Table 1-5
Description of Planning Issues/Management Concerns, their Desired Future Conditions/Visions, and Management Goals

Issue or Management Concern	Description of Desired Future Conditions/Visions and Management Goals
Soils	The desired future condition is for stable soils to contribute to properly functioning watersheds and support productive plant communities consistent with site potential. Management direction is needed to: 1) manage uses to minimize accelerated soil erosion and compaction and maintain surface soil water infiltration based on site-specific conditions; and, 2) maintain or improve soil health and fertility, prevent or minimize erosion and compaction while supporting multiple use management.
Water Resources	The desired future condition is for water bodies to have sufficient water quality to meet state and federal standards, and support designated beneficial uses. Management direction is needed to: 1) restore and/or maintain the chemical, physical and biological integrity of water resources to protect designated beneficial uses and achieve water quality standards; 2) maintain existing or acquire new water rights on BLM land to ensure water availability for multiple-use management; 3) minimize erosion and accelerated runoff to streams to improve watershed function; and, 4) protect water quality for municipal, industrial, agricultural, recreation, and residential purposes by adopting protective measures to meet tribal, state, and local water quality requirements.
Cultural Resources/ Traditional Cultural Properties/ Paleontological Resources	The desired future condition is for there to be a minimal loss or degradation of cultural resources and traditional cultural properties within the Butte Field Office. Management direction is needed to: 1) preserve and protect eligible cultural resources, and traditional cultural properties within the Butte Field Office; 2) identify cultural resource sites and traditional cultural properties and mitigate impacts when necessary, from natural or human-caused deterioration; and, 3) preserve and protect eligible cultural resources to ensure that they are available for appropriate uses by present and future generations.
Visual Resources	The vision is that a spectrum of visual qualities are provided and protected for the public. Management direction is needed to manage visual resources in accordance with VRM classifications described in **Appendix C – Visual Resource Management Classes.**
Lands and Realty	The vision is for the needs of the public to be met and support for all BLM resource programs is provided. Management direction is needed to: 1) look for opportunities to acquire non-federal land or interest in non-federal land with important resources and resource uses; and, 2) provide for land-use opportunities to provide a sustained flow of economic benefits and meet local infrastructure needs while protecting or minimizing adverse impacts to resources and resource uses.
Minerals and Energy	The vision is for the use of geologic resources to recognize the need for domestic sources of energy and minerals. Management direction is needed to: 1) ensure that federal minerals are available for energy and mineral exploration and development; 2) manage exploration and development of mineral resources and ensure they are conducted in an environmentally sound manner; and, 3) where possible, conserve significant or unique geological features.
Abandoned Mine Lands	The vision is for threats to human health and the environment from historic mining activities on public land to be reduced. Management direction is needed to: 1) reclaim AML sites on public land to improve water quality, plant communities, and diverse fish and wildlife habitat; 2) reduce and/or eliminate risks to human health from hazardous mine openings; and, 3) protect historic resources and wildlife habitat commonly associated with AML sites.

Table 1-5
Description of Planning Issues/Management Concerns, their Desired Future Conditions/Visions, and Management Goals

Issue or Management Concern	Description of Desired Future Conditions/Visions and Management Goals
Hazardous Materials Management	The vision is for employees, the public, and the environment to be protected from exposure to hazardous materials in public facilities or on public land. Management direction is needed to mitigate threats and reduce risks to the public and environment from hazardous materials.
Social and Economic Environment	The vision is for conservation, stewardship, and partnerships on public land are cultivated for the use and enjoyment of present and future generations. Management direction is needed to: 1) provide opportunities for economic benefits while minimizing adverse impacts to resources and resource uses; 2) provide for a diverse array of activities that result in social benefits for local residents, businesses, visitors, interested citizens, and future generations, while minimizing negative social effects; 3) sustain, and where appropriate, restore the health of forest, rangeland, aquatic, and riparian ecosystems administered by the BLM to provide a sustained flow of economic benefits within the capability of the ecosystem; 4) protect visual quality, wildlife habitats, and recreation opportunities on BLM lands to sustain non-market economic values; and, 5) make resource commodities available to provide a sustainable flow of economic benefits within the capability of the ecosystem.
Environmental Justice	Management direction is needed to identify and remediate to the extent possible disproportionate negative effects to minority or low income populations per Executive Order 12898.
Tribal Treaty Rights	Management direction is needed to accommodate treaty and legal rights of appropriate Native American groups in management of public lands.

Note: Unnumbered items are management concerns.

Issues Considered But Not Further Analyzed

During scoping, several concerns were raised that are beyond the scope of this planning effort or that represented questions on how the BLM would go about the planning process and implementation. There are several issues raised in scoping that are clearly of concern to the public but which are governed by existing laws and regulations (for example, water quality). Where certain management is already dictated by law or regulation, alternatives have not been developed; rather, management will instead be applied as "Management Common to All Alternatives."

The Scoping Report (USDI-BLM 2005b) and the BLM Final Surface Management Regulations EIS (USDI-BLM 2000a) provides a comprehensive list of issues outside the scope of the RMP or issues addressed through administrative or policy action. Some major issues were considered but not analyzed further because they are inconsistent with existing laws or higher level management direction, or because they are beyond the scope of the RMP purpose and goals. These issues are listed below.

- It would be useful if the EIS discussed the Hard Rock Mining Act of 1872, its benefits and impacts, and potential conflicts with the Clean Water Act, Clean Air Act, and Endangered Species Act.
- Minerals management should be greatly restricted.
- OHV recreationists in Montana generate total State and Federal annual gas tax revenue on the order of $8 million. A Federal excise tax refund program for gasoline used for off-road purposes does not exist at this time. Excise tax on gasoline used for off-road fuel use should either be refunded to off-highway recreationists or used to fund programs that benefit off-highway recreationists.
- OHV recreation and tourism has not been promoted or supported by Montana Fish, Wildlife and Parks (MFWP) as aggressively as other recreation and tourism associated with fish and wildlife programs. OHV users request that MFWP actively promote OHV recreation and tourism.
- OHV use should be eliminated from BLM lands.
- Commercial use of public lands should be encouraged and promoted over all other considerations.

PLANNING CRITERIA AND REGULATORY REQUIREMENTS

FLPMA is the primary authority for BLM's management of public lands. This law provides the overarching policy by which public lands will be managed and establishes provisions for land use planning, land acquisition and disposition, administration, range management, rights-of-way, designated management areas, and the repeal of certain pre-FLPMA laws and statutes.

NEPA requires the consideration and public availability of information regarding the environmental impacts of major federal actions significantly affecting the quality of the human environment.

BLM planning regulations (43CFR1600, Subpart 1610) require preparation of planning criteria to guide development of all resource management plans. Planning criteria guide the development of the plan and determine the approach to developing alternatives, and ultimately, the selection of a Preferred Alternative. The criteria serve to help ensure that plans are tailored to the identified issues and avoid unnecessary data collection and analyses.

Preliminary planning criteria were developed prior to public scoping meetings to set the side boards for focused planning and to guide decision making by topic. These criteria were introduced to the public for review in January 2004 at all scoping meetings. The public was encouraged to comment on, and suggest additions to, these criteria at the meetings, and through written correspondence. Final planning criteria included:

- The plan will comply with FLPMA and all other applicable laws.
- The planning process will include an EIS that will comply with NEPA standards.
- The plan will establish new guidance and identify existing guidance upon which the BLM will rely in managing public lands within the Decision Area.
- The RMP/EIS will incorporate by reference the Standards for Rangeland Health and Guidelines for Livestock Grazing Management; the Montana/Dakotas Statewide Fire Management Plan; Off-Highway Vehicle EIS and Plan Amendment for Montana, North Dakota, and Portions of South Dakota; the Final Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans; and Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States.
- The RMP/EIS will incorporate by reference all prior Wilderness Study Area findings, suitability studies, and reports that affect public lands.
- The plan will result in determinations as required by special program and resource specific guidance in Appendix C of the BLM's Planning Handbook.
- The plan will recognize the state's responsibility to manage wildlife populations, including uses such as hunting and fishing, within the Planning Area.
- Decisions in the plan will strive to be compatible with the existing plans and policies of adjacent local, state, tribal, and federal agencies as long as the decisions are in conformance with legal mandates on management of public lands.
- The scope of analysis will be consistent with the level of analysis in approved plans and in accordance with Bureau-wide standards and program guidance.
- Geospatial data will be automated within a Geographic Information System (GIS) to facilitate discussions of the affected environment, alternative formulation, effects analysis, and displaying the results.
- Resource allocations must be reasonable and achievable within available technological and budgetary constraints.
- The RMP will consider conservation and management strategies developed for protection, conservation, and restoration of Yellowstone and westslope cutthroat trout, bull trout, fluvial Arctic grayling and sage grouse.
- The RMP will incorporate existing recovery plans and management strategies and guidelines for federally listed threatened and endangered species, including Ute Ladies' Tresses, the Northern Continental Divide population of the grizzly bear, and lynx (the Lynx Conservation Assessment and Strategy). State management plans will be considered for delisted species including the peregrine falcon, bald eagle, wolf, and Yellowstone population of grizzly bear.
- The RMP will recognize the State of Montana's authority on Montana water law and water rights.
- The RMP will recognize federal land management agency obligations under tribal treaties and laws or executive orders on Native American reserved rights, religious freedoms, and traditional use areas.

RELATIONSHIP TO BLM POLICIES, PLANS, AND PROGRAMS

A number of plans have been developed by the BLM that relate to or otherwise govern management in the Planning Area. Some of these plans amended the Dillon MFP and Headwaters RMP while others, though they have not been formally adopted through the land use

planning process, are considered by BLM when implementation level planning is conducted or other specific actions are analyzed. Specific management actions from these plans must be in conformance with the Butte RMP and Record of Decision when completed. These major plans and other major management guidance are listed below and provide a perspective of the many management considerations pertinent to the Planning Area.

Land Use Plans and Amendments

- Mountain Foothills Rangeland Management Program Document (USDI-BLM 1981a).
- Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana, North Dakota and South Dakota ROD (USDI-BLM 1997).
- Elkhorns Travel Management Plan/Amendment (USDI-BLM *et al.* 1995).
- Off-Highway Vehicle ROD and Plan Amendment for Montana, North Dakota, and Portions of South Dakota (USDI-BLM 2003c).
- Clancy-Unionville Travel Management Plan/ Amendment (USDI-BLM 2000b).
- Whitetail-Pipestone Travel Management Plan/ Amendment (USDI-BLM 2003b).
- Suitability Report and EIS for Wilderness Designation of Humbug Spires Instant Study Area (USDI-BLM 1980).
- Sleeping Giant and Sheep Creek Wilderness Study Areas EIS (USDI-BLM 1991a).
- Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas (USDI-BLM 2003a).

Other National, Statewide, and Field Office Plans

- Vegetation Treatments Using Herbicides on BLM Lands in Seventeen Western States (USDI-BLM 2007).
- Bull Mountains Exchange Final EIS/ROD (USDI-BLM 1991b).
- The Montana Weed Management Plan (Duncan 2005).
- Northwest Area Noxious Weed Control Program Final Environmental Impact Statement (USDI-BLM 1985).
- Montana Statewide Wilderness Study Report (USDI-BLM 1991c).
- National Fire Plan and 2001 Federal Fire Policy.
- Oil and Gas Environmental Assessment of BLM Leasing Program, Butte District (USDI-BLM 1981b).
- Draft National BLM Sage Grouse Habitat Conservation Strategy (USDI-BLM 2003e).
- Healthy Forests Restoration Act.
- Interim Bull Trout Habitat Conservation Strategy and Implementation (USDI-BLM 1996a).

RELATED PLANS

BLM planning regulations require that BLM plans be consistent with officially approved or adopted resource related plans of other federal, state, local, and tribal governments as long as those plans are consistent with federal laws and regulations applicable to public lands. Plans formulated by federal, state, local, and tribal governments that relate to the RMP have been reviewed and no proposed management in this RMP is known to be inconsistent with these plans:

- Canadian Lynx Conservation Assessment and Strategy (Ruediger *et al.* 2000).
- Forest Plan – Helena National Forest (USDA-FS 1986a).
- Forest Plan – Beaverhead National Forest (USDA-FS 1986b).
- Forest Plan – Deerlodge National Forest (USDA-FS 1987).
- Grizzly Bear Recovery Plan (USFWS 1993).
- Grizzly Bear Management Plan for Southwestern Montana (MFWP 2002a).
- Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987).
- Montana Bald Eagle Management Plan (USBOR 1994).
- Pacific Bald Eagle Recovery Plan (USFWS 1986).
- Final PEIS on Wind Energy Development on BLM Administered Lands in the Western US, June 2005.
- Montana Gray Wolf Conservation and Management Plan (MFWP 2004a).
- Montana Nonpoint Source Management Plan (MDEQ 2007).

POLICY

No proclamations or legislative designations that would influence decisions or constrain the alternatives have been issued within the Decision Area.

Implementing the RMP begins when the Montana BLM State Director signs the ROD for the RMP. Decisions in the RMP would be implemented tied to the BLM budgeting process. An implementation schedule would be developed, providing for the systematic accomplishment of decisions in the approved RMP.

COLLABORATION

There are no formally designated cooperating agencies for the Butte RMP planning process. Collaboration and consultation with federal, state, and local agencies, and tribal governments is discussed further in Chapter 5.

CHANGES FROM THE DRAFT RMP TO THE PROPOSED RMP

Changes from the Draft RMP to the Proposed RMP are indicated with gray shading. Changes related to correcting typographical or grammatical errors, and other similar adjustments were considered minuscule and not to have any effect on alternative proposals or analyses. Such changes are not shaded in the document.

As a result of public comment and internal review of the Draft RMP/EIS, Alternative B (the Preferred Alternative in the Draft RMP/EIS) has been adjusted and represents the BLM's Preferred Alternative in the Proposed RMP/Final EIS. Changes regarding alternatives focused on adjustments to "Management Common to Action Alternatives" sections and for Alternative B in order to address public concerns and internal reviews while continuing to meet the BLM's legal and regulatory mandates. Changes are a result of:

- Adjustments to Management Common to Action Alternatives in some areas
- Adjustments to Alternative B
- Clarifications to better explain the management proposed in the Draft RMP/EIS
- Updates to information based on inventory updates after August 2005
- Updates to maps
- Other minor corrections

Some public comments suggested that alternatives to maximize particular uses or to maximize protection of certain resources should be analyzed in detail. While these types of alternatives were considered, they were not analyzed in detail because they did not meet BLM's multiple use and sustained yield mandate established in the FLPMA or the planning criteria set out in the Draft RMP/EIS. Other comments suggested consideration of items outside the scope of the BLM's decision authority. These items were not considered in this plan.

Other suggested modifications were within the range of alternatives analyzed by the BLM. The following descriptions of changes to proposed management in the Proposed RMP/Final EIS were within the range of the alternatives analyzed in the Draft RMP/EIS. Proposed management changes are indicated in Chapter 2. However, additional minor clarifications of analyses of effects have occurred in some places in Chapter 4 relative to changes to proposed management. These changes are located in the pertinent sections of Chapter 4 relative to the type of proposed management changed.

ADJUSTMENTS TO "MANAGEMENT COMMON TO ACTION ALTERNATIVES" – RMP LEVEL DECISIONS

Proposed "Management Common to Action Alternatives" for RMP decisions have been added or revised as follows.

Under Vegetation Communities in the Management Common to Action Alternatives section, under Forests and Woodlands, the following prescription has been added in the Proposed RMP/Final EIS: "The BLM would strive to maintain and/or restore stands with old forest structure within historic range of variability to maintain and/or enhance habitat for old growth dependent species."

Under Wildlife, Fish, Wildlife Habitat, Special Status and Priority Plant and Animal Species, the following prescriptions have been added under Management Common to Action Alternatives:

- "The BLM would emphasize providing habitat of sufficient quantity and quality, including connectivity and wildlife movement corridors, habitat complexity, forest openings, edges, and ecotones, to enhance biological diversity and provide quality, sustainable habitat for native wildlife species."
- "The BLM would emphasize maintaining and/or restoring the structure, composition, and function of aquatic ecosystems to support a diversity of aquatic plant and animal species and emphasize hydrologic connectivity within watersheds to maintain and/or restore habitat and connectivity needs for populations of aquatic dependent species."
- "The BLM would restore and/or maintain riparian structure, composition, and processes, including physical integrity of riparian ecosystems, amount and distribution of woody debris to sustain physical and biological complexity, adequate summer and winter thermal regulation, water quality and hydrologic processes, distribution and diversity of riparian vegetative communities and source habitats for riparian dependent species."

Under Wildlife, Fish, Wildlife Habitat, Special Status and Priority Plant and Animal Species, a newly developed prescription for managing big game security habitat has been included in the Management Common to Action Alternatives section which reads: "Functional Blocks of security habitat for big game species would be maintained across the landscape. Where minimum-size blocks of security habitat (250 acres), as described by Hillis et al. (1991), are located, they would be retained in a suitable condition during project planning and implementation. Protection of larger blocks of security habitat would also be addressed during project or watershed

level planning. Where security habitat is limited or fragmented across the landscape, the BLM would emphasize improving habitat through vegetation treatments and road closures (including seasonal closures) to increase security habitat for big game species." This prescription replaces alternative-specific prescriptions for Alternatives B, C, and D presented in the Draft RMP/EIS.

Under Travel Management and Access, the following prescriptions have been added in the Management Common to Action Alternatives section:

- "The BLM would emphasize management of the transportation system to reduce impacts to natural resources from authorized roads and trails. The BLM would also stress closing and restoring unauthorized user created roads and trails to prevent resource damage. Ecologically sensitive areas within 300 feet of roads and trails could be closed to dispersed camping if resource damage is found to be occurring in these areas."
- "Snowmobile use would be subject to restrictions outline in specific travel plans. It is the rider's responsibility to avoid locations where wind or topographic conditions may have reduced snow depth and created situations where damage to vegetation or soils could occur, or where vegetation is taller than the protective snow cover. Ecologically sensitive areas could be closed to snowmobiling if resource damage caused or exacerbated by snowmobile activity is found to be occurring in these areas."

Under Lands and Realty, in the Land Ownership Adjustment section, Management Common to Action Alternatives, the potential disposal acreage has been revised from 7,472 acres in the Draft RMP/EIS to 8,901 acres in the Proposed RMP/Final EIS through identification of additional isolated parcels of land that may be suitable for disposal.

Under Leasable Fluid Minerals, the Reasonable Foreseeable Development Scenario for oil and gas leasing has been changed for all action alternatives to the following: "Based on the analysis in the RFD scenario, it was estimated that up to 19 conventional oil and gas wildcat wells (exploratory wells drilled in an area with no existing production) might be drilled in the PA in the next 15 to 20 years. Of these 19 wells, it is estimated that 13 would be "dry" holes. Dry holes would be plugged and abandoned with surface reclamation occurring shortly afterward. It is further estimated that six of the wells could be completed for production. Each of the discovery wells would probably prompt additional step-out wells. A "step-out well" is a well drilled adjacent to or near a proven well to establish the limits and continuity of the oil or gas reservoir or to assist with production. It was estimated that 12 step-out wells would be drilled, two for each discovery. For analysis purposes seven of the producing wildcat and step-out wells are assumed to be BLM." This is a slight increase in the forecasted activity compared to the Draft RMP/EIS. Additional changes in the fluid minerals appendix (Appendix M of Proposed RMP/Final EIS) have also been made to reflect this slight increase.

ADJUSTMENTS TO ALTERNATIVE B – RMP LEVEL DECISIONS

Key proposed management that would be adopted through RMP decisions have been adjusted for Alternative B as follows based on public comment and internal review:

Under Vegetation Communities, in the Wildland Fire Management section, Fire Management Unit (FMU) polygon mapping has been adjusted to provide more flexibility for managing fire and fuels in the Big Hole River watershed in the vicinity of Wise River and Dewey. Approximately 9,000 acres that were identified in the C category in the Draft RMP/EIS have been moved to the B category.

Under Vegetation Communities, in the Noxious Weed Management section, the management prescription pertaining to aerial spraying of herbicides to treat noxious weeds has been modified to eliminate the provision for a 300-foot no-spray zone near riparian areas described in the Draft RMP/EIS. This prescription in the Proposed RMP/Final EIS now indicates that standard operating procedures and mitigation measures identified in the newly finalized Record of Decision for Vegetation Treatments using herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement would be followed under Alternative B.

Under Travel Management and Access, the prescription pertaining to competitive motorized events has been revised as follows to provide more management flexibility: "Organized competitive and non-competitive motorized events would be considered and evaluated on a case-by-case basis for the Pipestone area only (existing management). Non-competitive motorized events would not be allowed outside Pipestone. However, competitive motorized events (timed/speed based) proposed on BLM lands outside Pipestone would be considered, but only if held in conjunction with use of adjacent lands (public or private)."

Under Recreation Management, under Alternative B the prescription pertaining to outfitter guides has been changed to the following to ensure consistency with BLM policy: "Day-use Special Recreation Permits would be issued for commercial fishing and floating uses at BLM river access sites. Outfitters would be annually billed an advance flat fee (currently $90.00) established by the Director based on the Implicit Price Deflator Index. In the long-term, the BLM would continue to coordinate with MFWP to enhance river/corridor land management and to develop a multi-

agency statewide fee system for the commercial uses of river access sites."

Under Recreation Management, under Alternative B the prescription pertaining to variances to the 14-day camping limitation has been changed as follows to provide for management flexibility: "Variances to the 14-day camping limit during the hunting season would be considered on a case-by-case basis subject to the following considerations: resource impacts, social conflicts, sanitation concerns, no livestock, or commercial activities would be involved. Preference will be given to developed recreation sites during this low use period since they provide hardened camping units, toilet facilities, and good access."

Under Special Designations, The Spokane Creek potential ACEC has been dropped from Alternative B because the BLM believes that it can adequately manage the values in this area without the ACEC designation.

Under Special Designations, boundaries of the Elkhorns potential ACEC have been modified for Alternative B to exclude the Graymont Mine permitted area, the proposed expansion area for Graymont Mine, and the proposed Montana Army National Guard withdrawal area. The boundary was also expanded under this alternative to include the newly acquired Iron Mask property. These changes have altered the size of this potential ACEC from 53,439 acres in the Draft RMP/EIS to 50,431 acres in the Proposed RMP/Final EIS under Alternative B.

Under Leasable Fluid Minerals, an additional stipulation has been added to Alternative B for no surface occupancy within ½-mile for streams identified as having high restoration potential for native fish species. No such streams have been identified at this point for the Butte Field Office, but this could change in the future.

Under Locatable Minerals, the proposed mineral withdrawal for Muskrat Creek (180 acres in the riparian area) has been dropped from Alternative B because the BLM believes that aquatic resources there can be adequately protected using the existing mining regulations found at 43 CFR 3809 in the context of the proposed inclusion of this area in the Elkhorn Mountains ACEC as well as the proposed finding of suitability of Muskrat Creek for Wild and Scenic River designation.

Adjustments to Alternative B – Implementation Decisions

A number of changes have been made to Alternative B for three of the five site-specific travel plans being analyzed with this RMP revision. These are implementation decisions and are described in detail in the Travel Management and Access section, Activity Level Planning for Five High Priority Travel Planning Areas in Chapter 2.

In the Helena Travel Planning Area, Alternative B has been changed to essentially close the interior of the Scratchgravel Hills to wheeled motorized use year-round with the exception of a few right-of-way routes and routes needed for residential access. This change has been made to minimize ongoing illegal activity and reduce user conflicts associated with this area.

In the Boulder/Jefferson City Travel Planning Area, Alternative B has been slightly modified to provide an additional open route (with seasonal restrictions).

In the Upper Big Hole Travel Planning Area, a number of route-specific changes have been made to Alternative B to address public comments and management needs on the ground.

Addressing Global Climate Change

A section on global climate change has been added to Chapter 3 (under the Air Quality heading, Climate subheading) to describe global climate change and its potential effects on resources and resource uses in the Planning Area. A Global Climate Change section has also been added to Chapter 4 (after the Cumulative Effects on Social and Economic Conditions section) to discuss potential effects of BLM activities associated with the Butte RMP on global climate change.

Clarifications/Minor Changes

A number of text changes have been made to clarify certain aspects of specific proposed management prescriptions under the alternative descriptions in Chapter 2. These are highlighted in Chapter 2 where they appear. An example of this is additional specification on how forage reserve allotments would be managed in the Livestock Grazing section.

Under Recreation Management, in the Special Recreation Management Area (SRMA) section, some minor changes have been made to SRMA boundaries and titles under all the action alternatives. None of these changes have a marked effect on management of these areas compared to the Draft RMP/EIS.

Two additional appendices have been added: **Appendix B**, Laws, and **Appendix N**, Implementation and Monitoring.

Appendix A has been revised to include additional discussion of the process used by the BLM in developing site-specific travel plan alternatives.

The Biological Opinion received from the U.S. Fish and Wildlife Service as part of the Endangered Species Act consultation for this RMP revision has been added to **Appendix G**, Wildlife.

Updates to Data

Data and inventory information was frozen in August 2005 to ensure consistent analysis in the Draft RMP/EIS. Since then, there have been revisions to the BLM sur-

face land acreage total as a result of various land acquisitions/transactions as follows:

Draft RMP surface lands – 302,034 acres.

Proposed RMP surface lands – 307,309 acres.

The majority of newly acquired acres are in the Iron Mask acquisition in the Elkhorn Mountains, adjacent to pre-existing BLM lands.

Minor changes have been made throughout Chapter 2 by RMP alternative to address the increase in surface lands to account for management of newly acquired lands. Changes have been made to proposed travel management area designation acres, Fire Management Unit acreages, Visual Resource Management acreages, and Recreation Opportunity Spectrum acreages to match and be consistent with proposed management for adjacent BLM lands nearby the newly acquired acres.

There has also been refinement to the federal mineral estate acreage used in the Draft RMP/EIS based on some of the surface land administration changes as well as improved GIS information.

Draft RMP federal mineral estate – 678,189 acres.

Proposed RMP federal mineral estate – 652,194 acres.

Changes associated with the refined acreage of federal mineral estate have been made in Chapters 2 and 4 wherever analyses and discussion associated with acres available for oil and gas leasing, or acreages associated with specific oil and gas stipulations are involved. While most of these actual acreages have changed, there have been no substantive changes to proposed oil and gas stipulations that have caused any substantial relative changes in available acres compared to the Draft RMP.

A section on Wild Horses and Burros was added to Chapter 2 to describe that while the Butte Field Office does not have any wild horses or burros, there is a congressionally designated herd area in the Butte Field Office that would not be actively managed under all alternatives.

Information must continue to be considered dynamic and will continue to be updated as the plan is implemented. The BLM is required to continue inventorying public lands and to maintain the best available current information.

Map Changes

The Proposed RMP/Final EIS is designed to be used in conjunction with map information provided in the Draft RMP/EIS. Only maps that have changed since release of the Draft RMP/EIS have been produced for the Proposed RMP/Final EIS. In cases where maps have been produced for less than all of the alternatives in the Proposed RMP/Final EIS, readers should refer back to analogous maps in the Draft RMP/EIS for comparison with currently depicted management proposals on maps in the Proposed RMP/Final EIS.

Maps 2, 3, 4, and 5 have all been adjusted for the Proposed RMP/Final EIS to display mapping only for the BLM surface acres, including the newly acquired Iron Mask property near Townsend. Map 3 has been adjusted to reflect the change in FMU designations described above in the Big Hole River watershed.

Map 7 has been adjusted to reflect changes to Alternative B for the Helena Travel Planning Area.

Map 11 has been produced to display a change in Alternative B to the Ward Ranch trailhead location in the East Helena Travel Planning Area compared to its initial proposed location under this alternative in the Draft RMP/EIS.

Map 19 has been adjusted to reflect changes to Alternative B for the Boulder/Jefferson City Travel Planning Area.

Map 23 has been adjusted to reflect changes to Alternative B for the Upper Big Hole River Travel Planning Area.

Maps 26, 27, and 28 have been adjusted to reflect surface land adjustments in proposed management for Recreation Opportunity Spectrum.

Map 30 has been adjusted to reflect minor boundary and name changes to Special Recreation Management Areas under Alternatives B and C.

Map 32 has been reproduced to provide additional clarifying information on potential ACECs.

Maps 37, 38, and 39 have been adjusted to reflect surface land adjustments in proposed Visual Resource Management designations under Alternatives B, C, and D.

Map 41 has been updated to show additional mapped parcels for potential disposal.

Maps 42, 43, 44, and 45 have all been adjusted to reflect refinements to the federal mineral estate lands.

Map 46 has been adjusted to reflect the dropping of the Muskrat Creek mineral withdrawal proposal from Alternative B.

A new map, Map 47 has been created to depict a wild horse/burro herd area that exists in the Butte Field Office.

CHAPTER 2
ALTERNATIVES

CHAPTER 2
ALTERNATIVES

INTRODUCTION

This chapter describes alternative ways of resolving the planning issues and sustaining the long-term health, diversity, and productivity of public lands in the Planning Area. The range of alternatives includes different approaches to balancing demands on public land, managing and protecting resource values, and reducing conflicts.

This chapter contains the following sections:

- **Developing the Range of Alternatives** – describes the process and key concepts used to develop the range of alternatives considered in detail.
- **Overview of the Alternatives** – briefly describes each of the key components of the four alternatives considered in detail, and includes a description of why Alternative B was identified as the Preferred Alternative.
- **Alternatives Considered in Detail** – includes a summary of the major components of each alternative and a more detailed description of each alternative by issue category.
- **Alternatives Considered but Not Analyzed in Detail** – briefly describes alternatives that were considered, but not in detail with rationale.
- **Comparison of the Alternatives** – describes the measures used to compare alternatives and includes tabular comparison of the alternatives considered in detail.
- **Comparison of Impacts** – describes the impacts of the alternatives and includes tabular comparison of impacts for the alternatives considered in detail.

DEVELOPING THE RANGE OF ALTERNATIVES

The development of management alternatives for the Butte Resource Management Plan/Environmental Impact Statement was guided by provisions of the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA) as well as planning criteria listed in Chapter 1. Other laws, as well as Bureau of Land Management (BLM) planning regulations and policy, also directed alternative considerations and focused the alternatives on appropriate land use plan-level decisions. Field Office-wide goals and desired future conditions for individual resource and resource use programs were identified by the planning team in consideration of public comment received through scoping as well as direction established by Bureau-wide initiatives and mandates. The goals would apply to all alternatives.

Four management alternatives were developed to address the major planning issues and to provide direction for resource programs influencing land management. The alternatives vary in how they emphasize different combinations of resource uses and management activities to address issues and resolve conflicts among uses. As a result, program goals are met in varying degrees across the alternatives. Management activities and prescriptions for management concerns or programs not tied to major planning issues often contain few or no differences in management between alternatives.

Alternative A, continuation of current management or No Action, is based on existing planning decisions that remain valid and current direction and policy. The remaining alternatives were developed with input received during scoping. Site-specific travel plan alternatives (site-specific implementation decisions) were developed by the planning team with the assistance of community-based working groups sponsored by Lewis and Clark County for three of the five travel plan areas addressed in this plan.

Vegetation management and treatment proposals were developed through the use of a model called SIMPPLLE—Simulating Patterns and Processes at Landscape scales. This model allowed the planning team to establish an approximate picture of historic vegetative conditions in the context of natural disturbance regimes (such as wildland fire, insect outbreaks, etc.) upon which to base proposed vegetation treatments. Additional information on use of the SIMPPLLE is detailed in **Appendix D**.

OVERVIEW OF THE ALTERNATIVES

There are four alternatives considered in detail. This section provides a brief overview of each of those alternatives. Alternatives considered in detail include one "No Action" Alternative (Alternative A), and three "action" alternatives (Alternatives B-D) that would reflect various levels of change from the existing Headwaters RMP and Dillon MFP direction.

All alternatives include pre-existing management direction that is being carried forward in this RMP revision. This direction is presented in the section "Management Common to All Alternatives" and is not described in this overview. Continued management direction reflects the following categories:

1. Management Direction from legal statute, regulation, or manual direction. This management direc-

tion may not have been specifically included in the Headwaters RMP or Dillon MFP but includes management direction for things such as restricted uses near bald eagle nests or current regional decisions on noxious weed abatement techniques.

2. Management Direction from the Headwaters RMP/Dillon MFP, including amendments by subsequent modifications from other decisions that are not being revised by the Butte RMP.

Some of the issues identified early in this planning process were resolved using one approach in the "action alternatives". These are identified under the category "Management Direction Common to Action Alternatives" in the Alternatives Considered in Detail section. This management guidance represents areas where there was little controversy over the best way to resolve the issue. One example of this approach is the common management direction for the "action" alternatives to maintain or improve habitat conditions for special-status plant species by altering or removing trees and shrubs, prescriptive livestock grazing, prescribed and managed wildland fire, and planting. These components are not included in this overview.

Federal and state laws, regulations, and permitting requirements established to protect natural resources would be followed under all alternatives.

Alternative A – No Action

Alternative A is the continuation of present management, referred to as "No Action". This alternative would continue present management practices based on existing land use plans and other management decision documents. Direction contained in the Headwaters Resource Management Plan and the Dillon Management Framework Plan would continue to be implemented. Direction contained in existing laws, regulations, and policies would also continue. The current levels, methods, and mix of multiple use management would continue, and resource values would receive attention at present levels with relatively little specific management direction or priorities compared to other alternatives. Motorized access and motorized recreational opportunities would not change from the current condition. One ACEC (Sleeping Giant – 11,679 acres) would continue to be managed as such. Eligible Wild and Scenic River segments would continue to be managed to protect the values that make them eligible.

Alternative B – Preferred Alternative

This alternative emphasizes moderate levels of resource protection, use, and restoration. Alternative B places a priority on vegetative restoration. Quantities of forest-based commodity resources from vegetation restoration activities would be similar to Alternative A with a more holistic vegetative community perspective, greater than in Alternative C, but less than in Alternative D. Project-level wildlife habitat and riparian management measures would be greater than in Alternatives A and D due in part to establishment of Riparian Management Zones (RMZs) where managing for riparian values would be the focus, but less than in Alternative C where RMZs would be wider and with more protective management than under Alternative B.

Alternative B emphasizes more of a balance of motorized and non-motorized recreation and access opportunities compared to the other action alternatives (C and D). Four ACECs would be designated, totaling about 70,644 acres. Two rivers would be recommended as "suitable" for Wild and Scenic River designation. There would be more oil and gas leasing management measures than in Alternatives A and D, but less than in Alternative C. Alternative B represents the mix and variety of actions that in the opinion of BLM, best resolves the issues and management concerns and is therefore considered BLM's Preferred Alternative.

Alternative C

Alternative C emphasizes a lesser degree of vegetative restoration than any of the other alternatives. Production of forest-based commodity resources from vegetation restoration activities would be lowest of all alternatives. This alternative emphasizes a greater degree of project-level wildlife habitat and riparian management measures (wider Riparian Management Zones than Alternative B, no RMZs under Alternatives A or D) than in any other alternative.

Alternative C emphasizes non-motorized recreation opportunities more than the other alternatives. All potential ACECs (87,893 acres) would be designated with this alternative. All four river segments eligible for Wild and Scenic status would be found suitable and recommended for Wild and Scenic designation. Alternative C provides for the most oil and gas leasing management measures of any alternative.

Alternative D

Of all the alternatives, Alternative D emphasizes the greatest degree of active management to restore vegetative communities and would produce the greatest quantities of forest products from vegetation restoration activities of all alternatives. Alternative D features fewer wildlife habitat and riparian management measures than Alternatives B and C, but more than Alternative A. This alternative emphasizes motorized access and recreation opportunities more than Alternatives B and C. Three ACECs would be designated (23,695 acres). No river segments eligible for Wild and Scenic status would be found suitable or recommended for Wild and Scenic designation with this alternative. Alternative D would have the fewest oil and gas leasing management measures of all the alternatives.

GOALS COMMON TO ALL ALTERNATIVES FOR ALL BLM ACTIVITIES

Throughout the BFO, BLM authorized activities associated with all resource and resource use programs would meet or move toward meeting the following standards to the extent practicable:

- Uplands are in proper functioning condition;
- Riparian and wetland areas are in proper functioning condition;
- Water quality meets state standards;
- Air quality meets state standards; and
- Provide habitat as necessary, to maintain a viable and diverse population of native plant and animal species, including special status species.

These standards were originally described as rangeland health standards (USDI BLM 1997), but would be applied to all BLM authorized activities as "Land Health Standards." More detailed descriptions of characteristics associated with these standards can be found in the Standards for Rangeland Health and Guidelines for Livestock Grazing Management Butte District section of the publication *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana, North Dakota, and South Dakota*, BLM (1997).

VEGETATION COMMUNITIES

Management of vegetative communities includes grasslands and shrublands, forests and woodlands (including forestry and forest products), riparian vegetation, livestock grazing, wildland fire management, wildlife habitat, and noxious weeds.

Vegetation Goals

Goal 1 – Maintain and/or improve ecological site potential on woodland communities for sustainability and diversity.

Goal 2 – Manage dry forest types to contain healthy stands of site-appropriate species; stands relatively open, and reproduce desired vegetation species.

Goal 3 – Manage moist forest types to contain healthy stands that combine into a diversity of age classes, densities, and structure (including dead and down material).

Goal 4 – Manage old forest structures in a sustainable manner. (Note: old forest structures are defined by the following: large, old trees; large standing dead trees [snags]; fallen trees or logs on the forest floor; multiple canopy layers; and a developed, patchy understory. In forest types subject to frequent, low-intensity fire such as dry Douglas-fir or ponderosa pine, old forest structure is typically characterized by relatively open understories and fewer large fallen trees.)

Goal 5 – Manage upland vegetation communities to move toward or remain in proper functioning condition, including a full range of herbaceous and shrub species.

Goal 6 – Maintain or enhance communities of priority species or habitats (for example, mountain mahogany, sagebrush, bitterbrush) to provide desired ecological functions and values. Additional specific goals are included for specific types of management of vegetation communities.

Forests and Woodlands

Goal 1 – Restore and/or maintain the health and productivity of public forests, to provide a balance of forest and woodland resource benefits, as well as wildlife and watershed needs to present and future generations.

Goal 2 – Manage forestry resources to provide a sustained flow of local economic benefits and protect non-market economic values.

Riparian Vegetation

Goal 1 – Manage riparian and wetland communities to move toward or remain in proper functioning condition. When at this condition, these areas have the appropriate composition, density, and age structure for their specific area. These communities are generally sustainable and provide physical stability and adequate habitat for a wide range of aquatic and riparian dependent species.

Goal 2 – Manage wetland and riparian habitats to support healthy, diverse and abundant populations of fish and associated aquatic and riparian dependent species.

Livestock Grazing

Goal 1 – Manage for a sustainable level of livestock grazing while meeting or progressing toward Land Health Standards.

Goal 2 – Maintain, restore, or enhance BLM rangelands to meet the Land Health Standards.

Goal 3 – Manage livestock grazing to provide a sustained flow of local economic benefits and to protect non-market economic values.

Wildland Fire Management

Goal 1 – Provide an appropriate management response to all wildland fires, emphasizing firefighter and public safety.

Goal 2 – Move toward restoring and maintaining desired ecological conditions consistent with appropriate fire regimes.

Goal 3 – Minimize the adverse effects of fire on resources, resource uses, and wildland-urban interface.

Goal 4 – Promote seamless fire management planning across jurisdictions within the boundaries of the BFO.

Goal 5 – Protect life and property by treating hazardous fuels on BLM lands near WUI.

Noxious Weed Management

Goal – Minimize infestations of invasive plants and noxious weeds.

General Approach of Vegetation Management Activities

The following discussion describes the approach that would be used for vegetation management activities within vegetation types found in the Decision Area under all alternatives. While in most cases vegetation treatments would be geared toward meeting historic vegetation conditions, it is recognized that this would not necessarily be the case in Wildland Urban Interface (WUI) areas where more substantial fuels reductions may be needed to meet site-specific conditions.

Grassland and Shrublands

Prior to effective fire suppression, foothill grasslands were maintained free of invading trees and shrubs by periodic fires. With successful fire suppression, many grasslands are becoming woodlands or shrublands, and many shrublands are being converted to woodlands. These vegetation types would be treated to remove conifer encroachment and move towards a more desired ecological condition of open grasslands and shrublands with a low density of trees species. Grasslands and shrublands would also be assessed to ensure that uplands are in properly functioning condition. If these habitat types are not in properly functioning condition due to management activities, management would be modified to improve conditions.

Forest and Woodlands

Dry Forest Types

Lower to mid-elevation dry forests are dominated by Douglas-fir and ponderosa pine. These forest types are typically interspersed with limber pine, Rocky Mountain juniper, grasses, and shrubs. Fire suppression and historic grazing practices have resulted in unusually high tree densities on many sites as well as excessive wildland fuels.

Treatments would be designed to mimic pre-fire suppression conditions and promote healthy and diverse forest ecosystems and wildlife habitat. Smaller diameter thinning along with low intensity understory burning would occur in seedling, pole and some medium (9 to 15 inch diameter at breast height (DBH)) sized trees to open the canopy and allow understory vegetation to become re-established. In the WUI, treatment emphasis would include mechanical or hand thinning, while prescribed burning would be minimized to lessen smoke impacts to local communities. Where burning is restricted, material could be mechanically reduced and left on site or mechanically reduced and removed. Outside the urban interface, prescribed burning would be emphasized except when not economically feasible or when the effects could be detrimental to vegetation or soils.

Mechanical treatments, which may include harvest of trees, would be used to accomplish restoration and thinning of dry forests. Trees in the small to large size classes would produce commercial forest products including lumber, posts and poles, and biomass.

Cool, Moist Forest Types

Cool, moist forest types are found at mid to high elevation and are dominated by Douglas-fir, lodgepole pine, subalpine fir and spruce. These forest types usually have higher tree densities with open parks and grass or shrub dominated meadows interspersed. Examination of BLM forest inventory data and analysis using the SIMPPLLE model indicates that the overall character of the forests found on BLM lands have changed over time with a reduction in the size and age class diversity within the majority of forest stands, and a reduction in the number and sizes of forest openings.

Treatments would focus on protecting healthy and diverse forest systems by reducing stem densities and creating appropriate openings to mimic pre-fire suppression conditions. In lodgepole pine stands, mechanical treatments which may include timber harvest would be used to create openings to mimic stand-replacing fire events and to regenerate lodgepole pine.

Riparian Types

Riparian habitat can include vegetation such as aspen, cottonwood, willows, dogwood, and alder as well as a variety of other riparian dependant species. Riparian habitat can also consist of conifers such as Douglas-fir, lodgepole pine, ponderosa pine, and spruce. Riparian areas occur throughout all forest types, grasslands, and shrublands and have experienced many of the same effects of long-term fire suppression as described above. Some riparian habitats in the PA have also been degraded due to inappropriate historic grazing, mining, timber harvest, and road construction. Some riparian areas contain aspen clones that are being lost due to conifer encroachment or grazing by livestock and/or big game. Where conifers are outcompeting or precluding regeneration of aspen, potential aspen or cottonwood stands, conifers would be removed to provide suitable habitat for expansion of these species.

The emphasis for riparian areas would be on protection and restoration. Treatments in riparian areas would focus on re-establishing willows, aspen, and cottonwood stands as well as other riparian vegetation and to move towards pre-fire suppression stem densities in conifer stands. Riparian areas would continue to be evaluated using Land Health Standards and grazing practices would be modified when necessary.

Vegetation Management Tools

A number of different vegetation management tools or activities would be common to all alternatives in implementing the approach described above.

Mechanical treatments would include tree removal through the use of ground based equipment, horses, helicopters, or any other appropriate methods. This would include thinning/removing medium (9 to 15 inch DBH) and large (greater than 15 inch DBH) trees and obtaining commercial wood products, thinning non-commercial-sized trees, and cutting non-commercial conifers that have "encroached" into grassland or sagebrush habitats. It would also include mechanical on-site treatments of non-commercial trees and biomass (vegetative materials that are by-products of management including 4 to 8 inch DBH trees) such as chipping, grinding, piling, or portable biomass/energy production. Mechanical treatments would be used to restore vegetative communities to desired future conditions as well as to reduce fuels in Wildland Urban Interface (WUI) areas.

The amount of forest products harvested would vary by alternative. This is due to different geographic priorities, acreage of vegetative treatments, and associated access development needed for successful treatment completion by alternative. Commercial uses of materials from vegetation management activities would be considered in all cases where appropriate.

Prescribed burning would be used to treat forest, grassland, or shrubland vegetation types. In grasslands or shrublands, prescribed burning would be used to kill encroaching conifers, removing dead finer fuels created by years of grass or shrub growth, and stimulating grass and shrub re-growth. In forests, prescribed burning would be used to reduce fuels generated by mechanical treatments and to thin understories, recycle nutrients, eliminate ladder fuels, create small openings or create and maintain a more savannah-like habitat, in stands dominated by medium and large-sized trees.

Noxious weed treatments would include, but not be limited to, hand-pulling; chemical spray; use of biological agents such as insects, goats, or sheep; cultural treatments such as modifying timing or intensity of other management activities; and public outreach. Other appropriate methods would be applied as they are developed and approved for use.

Changing grazing management or prescription grazing would also be used as a vegetative treatment. Management may include changing the season of use, the intensity of the use, or the kind of livestock.

General Summary of Alternative Emphasis for Vegetative Communities

Alternative A would continue current management. Project-specific objectives and treatment types would be as described under "Actions Common to All." Projects would stem largely from reducing fuels in the WUI, performing silvicultural treatments, and deriving forest products from stand by stand management on a sustained yield basis. Some projects to improve grassland and shrubland habitats in big game winter range areas would also occur.

Alternative B would emphasize maintaining and restoring healthy, diverse, and productive native plant communities appropriate to local site conditions. This alternative would identify opportunities to actively restore vegetation on the landscape to conditions more consistent with landform, climate, biological, and physical components of the ecosystem. Vegetation structure, density, species composition, patch size, pattern, and distribution would be managed to provide habitat for a variety of wildlife species while reducing the risk of uncharacteristically large and severe disturbances (such as forest insect epidemics, wildland fires). Actions would maintain or mimic natural disturbance regimes to provide for diverse and sustainable ecosystems so that plant communities would be resilient to periodic outbreaks of insects, disease and wildland fire.

The major emphasis areas under Alternative B would be fuels reduction in the urban interface, reduction of conifer encroachment in grasslands and shrublands particularly in big game winter range areas, restoration of sagebrush habitat, enhancement of bighorn sheep habitat, and restoration of dry forest types. Treatments of cool, moist forests have lower priority under this alternative. Priority for restoration and protection treatments would be given to forested areas with heavy fuel concentrations, limited vegetative diversity, and declining in health. Areas with an increasing risk of insect infestation or loss of important habitat values would also be given precedence for treatment. Priority areas for treatment under Alternative B include the Jefferson, Upper Missouri, and Big Hole watersheds.

Alternative C would provide for ecosystem health and diversity by focusing efforts on maintenance and protection of current conditions. As with the other action alternatives, vegetative treatments would still allow for restoration of habitats that are substantially outside the range of the historic condition, which are based on 500 year vegetative habitat trends from an analysis of current vegetation in the SIMPPLLE computer model. (**Appendix D – SIMPPLLE Model)** High priority habitats would include dry forest habitat and grasslands and shrublands in big game winter range areas. Treatment of the WUI to reduce the risk of fire would also be high priority for this alternative. In general, treatments for ecosystem health, habitat patch size and treatments to reduce the threat of wildland fire in the urban interface would be smaller under Alternative C than the other two action alternatives.

The priority treatment areas in Alternative C would be forested locations that have existing road access and the

Upper Missouri watershed due to higher urban interface concerns there.

Alternative D would have a similar emphasis and approach as Alternative B, but would include areas requiring a greater degree of vehicular access development. The major focus areas under Alternative D would be fuels reduction in the urban interface, reduction of conifer encroachment in grasslands and shrublands, restoration of dry forest types, and maintenance of existing "healthy" forests (such as open, "savannah" dry forest types). Priority areas for restoration and protection treatments include Jefferson, Upper Missouri, and Big Hole watersheds.

Historic vegetative acres generated by the SIMPPLLE Model **(Appendix D)** for each major watershed were used as a "guide" to determining the number of acres proposed for treatment in different habitat types.

For each action alternative, vegetative treatment acres were further refined by taking into consideration the following factors; adjacent land ownership and management, recreation sites, urban interface, designated semi-primitive areas, access to public lands, the existing road system, past treatments, wildlife habitat, wildfires, weed infestations, and topographical features. Current and past budgets were also used to verify the potential treatment acres by alternative. With the exception of noxious weed treatments, no Wilderness Study Areas were identified for treatments.

Proposed vegetation management actions described below refer to "project area" and "treatment area". A project area is a large area within which some type of management activity would occur and encompasses a region defined by logical boundaries such as; watersheds, ridges, highways or blocks of BLM lands. The project area can be both the analysis area and a starting point to determine where treatments should occur. A treatment area is a smaller block of land within the project area. A treatment area is the boundary of the area where the actual management activity, such as timber harvest or burning, would occur.

Proposed vegetation treatments are characterized below by numbers of acres (ranges) per decade. Multiple activities could occur within a single treatment area, concurrently or over time. For example, if 500 acres of grassland are proposed for treatment in an alternative, then there could be a conifer removal, or "slashing" treatment on these acres, followed by a separate prescribed burning treatment on the same acres, but since these treatments were applied to the same acres they would be considered as 500 acres of treatment in the context of RMP implementation.

Management Common to All Alternatives

Forests and Woodlands

Vegetation structure, density, species composition, patch size, pattern, and distribution would be managed in a manner to reduce the occurrence of unnaturally large and severe wildland fires and forest insect outbreaks.

Stands with characteristics indicating a substantial risk of developing epidemic levels of forest insects and/or disease would be high priority for treatments to reduce risk.

The forest product small sale program would continue to maintain a balance between public demand and the health and productivity of native and desired vegetation communities. Small forest product sales include over-the-counter sales of firewood, Christmas trees or other products for personal use, small amounts of materials removed as a result of other authorizations such as rights-of-way, road use agreements, grazing leases or other land uses, and public demand sawtimber or salvage sales. These activities usually take place in small areas or on scattered or isolated parcels often concurrent with similar activities on adjacent private lands.

Other products would include: house logs, posts and poles, vegetative cuttings, conifer boughs, wildings and ornamentals, grape stakes, juniper products, specialty cuttings, and wildflowers.

Salvage of forest products resulting from wildland fire, prescribed fire, forest insects and disease, weather induced or other forest mortality events would be considered.

Timber salvage project areas would consist of small openings, thinning between openings, and retention patches. In the context of large-scale wildland fire or forest insect and disease outbreaks, patches of dead and dying forest would be maintained for wildlife dependent upon this habitat.

In all areas with dead and dying trees (including retention patches), tree cutting would be allowed for human safety, fire rehabilitation and stabilization, and forest or stream restoration activities.

Silvicultural prescriptions would be consistent with accepted methods related to site, species, habitat types, and the individual requirements of the forest stand. Tractor logging generally would be limited to slopes with average gradients of less than 40 percent and the season of logging would be limited to reduce soil compaction and rutting (**Appendix E – BMPs**).

Adequate access would be maintained for management activities and treatments. Road locations would be determined on the basis of topography, drainage, soil type, and other natural features to minimize erosion. Skid roads would be rehabilitated by appropriate methods that

disperse runoff, reduce erosion, and promote revegetation as needed.

Slash disposal would be conducive to revegetation and advantageous to the passage of big game. Slash would be burned when necessary. All mechanical and prescribed burn treatments would be in conformance with Best Management Practices (see **Appendix E –BMPs**).

Mechanical treatments would be laid out to minimize the risk of windthrow, and shelterwood harvests would be made to improve genetic composition of the regenerated stand. Whenever possible, openings larger than 20 acres in size resulting from forest treatment or large scale events in forested habitats would be planted when natural regeneration does not become established to desired levels within 15 years or cannot be reasonably expected in five to fifteen years.

Riparian

At the Field Office scale, management would restore and improve riparian areas and wetlands. Riparian areas that are functioning at risk would be a high priority for restoration.

Authorized activities within riparian areas would strive to maintain and restore riparian structure and function, benefit fish and riparian-dependant species, enhance conservation of organisms that depend on the transition zone between upslope and the stream, and maintain or improve the connectivity of travel and dispersal corridors for terrestrial animals and plants. When projects that cause detrimental effects on riparian resources cannot be located outside of riparian areas, short-term and long-term effects would be minimized.

Streams and riparian habitats that have been degraded or lost due to the effects of historic mining operations, including placer mining, would continue to be restored to improve water quality as well as aquatic and riparian habitats. The BLM HazMat/AML Program(s) would continue to cooperatively work on a watershed-by-watershed basis reducing exposures to human health and the environment from AML sites. Reclamation of these areas typically include; removing contaminated soils and tailings, preventing run-off of heavy metals, reconstructing/stabilizing streambeds and banks (including providing habitat features such as down woody material and planting or restoring riparian vegetation), reducing sedimentation, closing physical safety hazards, and closing/stabilizing roads. Following reclamation, sites would be monitored to evaluate if the reclamation risk reduction project goals were achieved, if additional restoration efforts are necessary to restore or improve aquatic and/or riparian habitats and the effectiveness of the project(s) to determine if a viable fishery has been or could be established.

Forested riparian habitats would be managed to accelerate the development of mature forest communities to promote shade, bank stability, and woody debris recruitment. Late-successional riparian vegetation would be promoted in amounts and distribution similar to historic conditions.

Riparian and wetland management would be consistent with all state and federal laws and regulations. Actions would be taken to cooperatively conserve riparian/wetland habitat, minimize the impacts, loss or degradation of wetlands, and preserve values served by floodplains where occurring on public land while reducing hazards to human safety.

Site specific objectives and management strategies would be developed and applied through activity plans to meet the Standards for Rangeland Health. (**Appendix F – Land Health Standards**) Riparian protection would be provided by the Montana Streamside Management Zone Law (77-5-301 through 307 MCA). Streamside Management Zones (SMZs) provide regulation for the protection of water quality. Within SMZs, there are specific restrictions on certain forest activities, including; timber harvest design, timber cutting and removal (including clearcutting), the use of heavy equipment, slash disposal, broadcast burning, off-road vehicle operation, and road construction (unless necessary for stream crossing). SMZs also address the handling, storage, application, or disposal of hazardous or toxic substances. The SMZ is defined as "the stream, lake, or other body of water and an adjacent area of varying width where management practices that might affect wildlife habitat or water quality, fish, or other aquatic resources need to be modified." The SMZ encompasses a strip at least 50 feet wide on each side of a stream, lake, or other body of water, measured from the ordinary high water mark, and extends beyond the high water mark to include wetlands and areas that provide additional protection in zones with steep slopes or erosive soils. The SMZ provides the minimum regulatory standards for forest practices in riparian areas.

Ephemeral drainages and some mapped intermittent streams would not be covered by the SMZs under the definitions in the state regulations. These areas, however, could be covered by management restrictions commonly known as Best Management Practices (**Appendix E – BMPs**). Consistent with the SMZ law, forest and fuel management activities would be allowed in the riparian ephemeral areas and intermittent stream areas to meet riparian restoration or maintenance objectives and only if adequate woody material remains in the riparian area. In these situations, forest management activities would follow BMPs.

Riparian communities, habitat, and associated uplands would be treated and restored through implementation of livestock grazing guidelines to meet Rangeland Health Standards, as well as AML reclamation.

Livestock Grazing

Objectives for livestock grazing would be to meet the Standards for Rangeland Health and Guidelines for

Livestock Grazing Management Butte District section of the publication *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana, North Dakota, and South Dakota*, BLM (1997), which would be incorporated into livestock grazing permits and leases.

Allotment Management Plans and Coordinated Resource Management Plans would continue to be implemented, including utilization objectives and associated range improvement projects.

Land Health Standards would be used with Best Management Practices for livestock grazing that meet or exceed those approved by the State of Montana in order to maintain, restore, or enhance water quality when authorizing grazing along with site-specific vegetation objectives.

Cooperatively managed allotments with the USFS, Missoula, and Dillon Field Offices would continue under existing Memoranda of Understanding. Cooperative management of the Bull Mountain Game Range would continue with the USFS.

Applications for unleased allotments and vacant available lands (areas of land not segregated into allotments open to leasing by qualified applicants) would be considered on a case-by-case basis.

Existing utilization objectives set through interdisciplinary NEPA, Allotment Management Plan, or Coordinated RMP planning processes would continue in effect.

Adjustments to livestock management practices or livestock numbers, including increases or decreases, would be made based on results of monitoring studies, rangeland health assessments, allotment evaluations, and interdisciplinary review.

The health and integrity of riparian areas and wetlands would be maintained and improved by using tools such as livestock fencing, alternate upland water sources or livestock grazing adjustments (timing and stocking rates).

Functional wildlife escape ramps would be installed and maintained on all water tanks on BLM lands.

Grazing practices in riparian areas (accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of riparian goals or proper functioning condition would be modified. Where livestock grazing is the cause of degraded conditions, grazing would be suspended on a case-by-case basis if adjusting practices is not effective in meeting riparian goals or proper functioning condition.

New fences would be built to standard BLM wildlife specifications to allow wildlife passage, with the exception of fences built specifically to keep ungulates out of an area or fences built to meet specific public safety or other administrative purposes. Existing fences not meeting standard BLM wildlife specifications would be modified to meet the standard when reconstruction is done.

Wildlife habitat, grassland, sagebrush, and shrubland health of individual allotments would be assessed. Livestock grazing guidelines would be implemented to maintain or improve conditions when degradation due to grazing has been identified. Livestock grazing guidelines for residual cover and monitoring forage utilization in new or revised Allotment Management Plans would be developed.

No new term grazing permits would be authorized on river islands because of fencing issues, and to reduce conflicts between recreational use and grazing use as well as improving water quality.

Water developments for livestock generally would not be established in areas where significant conflicts for wildlife forage and habitat could occur.

Range improvements generally would be designed to achieve both wildlife and range objectives.

Sufficient forage and cover would be provided for wildlife on seasonal habitat.

Wildland Fire Management

The Beaverhead-Deerlodge National Forest, Helena National Forest, Gallatin National Forest, and the State of Montana DNRC would implement fire preparedness, prevention, and suppression on BLM administered lands through the interagency offset and six party fire protection agreements.

Use of retardant in Wilderness Areas or WSAs would be avoided and would require line officer approval.

Use of heavy equipment would be restricted to areas outside of Wilderness or WSAs.

Minimum Impact Suppression Tactics would be used when working in a Wilderness Area or WSAs, following the Interim Management Policy and Guidelines for Lands under Wilderness Review (BLM Handbook H-8550-1).

BLM would manage naturally ignited wildland fires in the Elkhorn Mountain units under the prescription guidelines established in the Elkhorn Mountains Fire Management Plan.

Fire Management activities (wildland fire, fuels, and fire mitigation, education and prevention) would be prioritized by their risk of life and property across the Planning Area. Fires that are adjacent to or near WUI would have highest priority for fire suppression.

Fire management activities would be designed and implemented in a manner that meets, or moves toward meeting Land Health Standards. Wildland fire management activities would be conducted to meet or move toward meeting Land Health Standards when compliant with the standards for fire operations.

Planned prescribed fire unit size would be determined by an interdisciplinary team through site specific NEPA analysis.

BLM would use the BLM's Emergency Fire Rehabilitation Handbook (H-1742-1) outlining the process for implementing emergency fire rehabilitation projects following wildland fires and wildland fire use.

Emergency fire rehabilitation funds may be used to:

- Protect life, property, and soil, water and vegetation resources;
- Prevent unacceptable onsite or offsite damage;
- Facilitate meeting land use plan goals and other Federal laws; and
- Reduce the invasion and establishment of undesirable or invasive vegetation.

Incident bases, camps, helibases, staging areas, and other incident management activities would be located outside of riparian areas. If unavoidable, an exemption could be made by a resource advisor.

BLM would implement management actions that maintain or move plant communities to the historic fire regime and condition classes. In areas where the environment has changed substantially and a return to historic conditions is not possible or ecologically desirable, the appropriate fire regime would be determined based on current management.

Following large wildland fires, burned areas would be evaluated for appropriate biological, salvage, and physical rehabilitation activities.

Provide assistance to communities in developing and maintaining community wildland fire protection plans.

In all alternatives, fire management objectives would be associated with Fire Management Units (FMUs). The Planning Area would be divided into FMUs and BLM lands would be designated into fire management categories described below.

Category A Areas

Wildland fire is not desired in these areas. The fire management emphasis should be placed on prevention, detection, rapid response, use of appropriate suppression techniques and tools, and non-fire fuels treatments. Fire suppression may be required to prevent unacceptable resource damage or to prevent loss of life or property. Emphasis would be focused on those actions that would reduce unwanted ignitions and reduce losses from unwanted wildland fire.

Category B Areas

These are areas where unplanned fire (natural or human-caused) is likely to cause negative effects, but these effects can be minimized or avoided through fuels management (e.g., prescribed fire), prevention of human caused fire, or other strategies. Prevention and mitigation programs to reduce unwanted fire ignitions and resource threats would be emphasized. Fire suppression would be the objective for unplanned wildland fire. Fire and non-fire fuels treatments reduce the effects of unplanned wildland fire. Restorative treatments would consist of multiple non-fire treatments before the use of fire would be considered.

Category C Areas

These are areas where wildland fire use and prescribed fire is desired to manage ecosystems but there are substantial constraints that must be considered for its use. These constraints would include critical wildlife habitat, air quality, or Threatened and Endangered species. Resource consideration would be described in terms of maximum acreage, time of year or burned acres per decade from all types of fire. These areas would receive lower suppression priority in multiple wildland fire situations. Fire and non-fire fuels treatments would be utilized to ensure constraints are met or to reduce any hazardous effects of unplanned wildland fire.

Category D Areas

These are areas where fire is desired, with no constraints associated with resource condition or social economic or political consideration (i.e. where natural and management-ignited fire may be used to achieve desired objectives, such as to improve vegetation or watershed condition). These areas offer the greatest opportunity to use the full range of options available for managing wildland fire under the appropriate management response.

Noxious Weed Management

BLM would manage Montana state and county designated noxious weeds and invasive plants according to the principles of Integrated Weed Management, Partners Against Weeds: An Action Plan for the BLM (USDI-BLM 1996b), Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (USDI-BLM 2007), the Montana Weed Management Plan (Duncan 2005), the Noxious Weed Control Plan, Bureau of Land Management, Butte District, Headwaters Resource Area (USDI-BLM 1986b) or the most current BFO noxious weed control plan, and other applicable federal, state, and local laws, statutes, plans, and regulations.

BLM would continue cooperative agreements with County and State entities. Management efforts would be coordinated with other Federal, State, and County agencies, weed management areas, and private landowners and organizations.

Under all alternatives, BLM would focus prevention of weed spread along roads, trails, waterways, recreation sites, and disturbed sites due to project implementation.

BLM would continue to use a combination of cultural, physical, chemical, and biological treatments for weed control. Chemical and biological treatment techniques

would conform to BLM guidelines and state and federal laws.

Weed seed free forage would be used on BLM lands. Forage subject to this rule would include hay, grains, cubes, pelletized feeds, straw, and mulch.

Weed management prescriptions would be included in all new treatment projects and incorporated where possible in all existing contracts, agreements, and land use authorizations that would result in ground-disturbing activities.

Monitoring would be conducted to determine if weed treatment strategies are effective at the project level and Planning Area- and Decision Area-wide.

Approximately 10 to 15 percent of proposed weed treatment acres by alternatives are expected to be newly treated acres. Most of the treated acres would be repeated treatments on the same areas because successful weed control usually requires multiple treatments and/or combinations of treatment methods.

Alternative A – No Action

Grasslands and Shrublands

BLM would continue to assess the health of herbaceous and shrub species during rangeland health assessments with priority given to wooded riparian and upland broadleaf shrub communities. Fire restoration and rehabilitation standards would continue to be compatible with landscape resource management objectives and long-term (25-year) vegetation health protection and fuel management. Under Alternative A, the objective would be to treat approximately 5,250 acres of grassland and shrubland per decade, primarily to reduce conifer encroachment into these areas.

Forests and Woodlands

The forestry program would continue to address forest stand management and development, as well as insect and disease detection and control. Forest stand harvesting and treatments would enhance or maintain healthy structure, density, species composition, pattern, and distribution to promote forest productivity and reduce the occurrence of forest disease and insect outbreaks. Forest stands would be managed to be resilient when periodic fire events occur and products would be salvaged from such events.

Forest and woodland treatment objectives under Alternative A would be as follows. Approximately 3,600 acres of dry forest types that are medium to large size with high tree densities would be treated per decade. Approximately 400 acres of treatments per decade would take place in similarly structured cool and moist forest types. Because the forest management program was not functioning at its present level until 1996, acreage estimates are based on forest management activities since 1996.

Thinning, forest product removal, and prescribed burning methods to reduce the amount of forest or wooded area with the potential for high severity wildland fire would continue. No mechanical treatments specifically targeting limber pine would occur.

Adequate access for management activities would be maintained. If needed, up to 5.5 miles of new, permanent roads could be constructed per year to provide access for treatments.

Forest and Woodland Products

A full range of forest management activities, including timber production, would occur on high priority forest management areas, consistent with the Timber Production Capability Classification. Forest condition assessment activity plans or landscape analysis would be required. Landscape analysis may also be used to incorporate multiple resource considerations into general forest management activities.

Objectives for the Probable Sale Quantity (PSQ) would be at current levels of 12 million board feet (MMBF) per decade or 40,000 hundred cubic feet (CCF). This could range as high as 27 MMBF (97,000 CCF) per decade if forest treatments are increased up to 750 acres per year as allowed under the 1984 Headwaters RMP. All sales would be required to conform to guidelines developed in the Dillon Sustained Yield Unit Timber Management Plan (USDI-BLM 1977). BLM forest planners would continue to use information gathered through forest inventory, landscape analysis, and regeneration surveys to manage for production of forest products and initiate forest development and artificial reforestation projects.

A full range of forest management activities would occur on low priority forest management areas. Forest activity plans would continue to be adjusted for intensity with timber production a secondary consideration where other substantial resource values are identified. Public land within set-aside areas would generally not be harvested.

The Sleeping Giant, Scratchgravel Hills, and Muskrat Creek area within the Elkhorn Mountains would not be available for forest management activities.

The small sale program would continue to be permitted on forestland that is available for harvest. Occasional free use may be authorized to clean up concentrations of debris or to serve other public purposes such as education, material needs by public agencies or recognized charitable, non-profit activity support, provided the free-use materials are not later offered for sale by the receiving party. The forestry program would provide the estimated quantities of permits and products under the small sale program shown in **Table 2-23.**

Personal use firewood permits valid for wood collection from both BLM and Forest Service lands in Western Montana would continue to be offered by BLM in cooperation with the Forest Service.

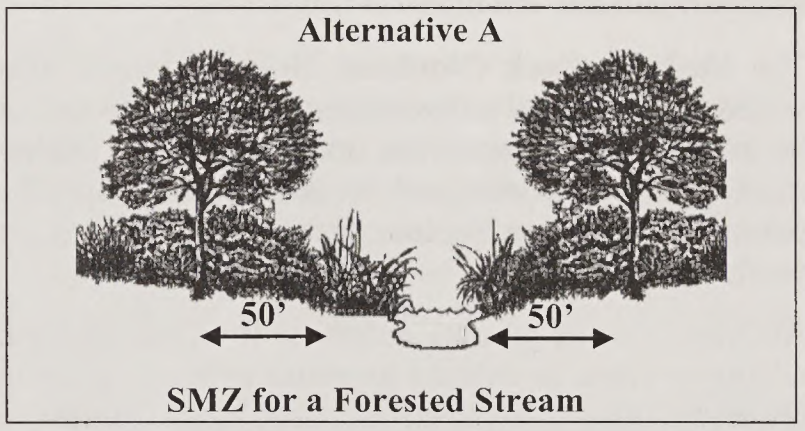
Removal of dead and down trees would be allowed for firewood gathering. Use of live trees for firewood gathering by the public or for commercial purposes would also continue under other BLM authorities, authorized on a case by case basis after review and compliance with NEPA.

The Silvicultural Guidelines and Harvesting Management Practices outlined below would continue.

- Roads constructed for timber harvests would be to minimum standards necessary to remove timber, unless the roads are needed for other public purposes requiring a higher standard.
- Forest activity plans would incorporate the Guidelines from the Montana Cooperative Elk Logging Study (Lyons *et. al.* 1985).
- Snag management would be implemented for cavity-nesting and denning habitat.
- The Elkhorns area would be managed as per the Elkhorn Mountains Landscape Analysis and the South Elkhorn Implementation Project Analysis. Timber harvest in the Elkhorn Wildlife Management Area (RMP management unit #36 in 1984 Headwaters RMP) in the Nursery Creek area would be allowed only for wildlife habitat improvement. This plan includes the following management objectives and guidelines:
    a. Management activities would be designed to maintain or improve elk, mule deer, and moose habitat, with primary emphasis on elk summer habitat and calving areas.
    b. Management activities would be designed to maintain or enhance opportunities for dispersed recreation, to the extent permitted by wildlife habitat objectives.
    c. The existing road network generally would remain open on routes designated in the Elkhorn Mountains Travel Management Plan. Seasonal restrictions may be imposed on forest treatment activities to minimize impacts on big game values and during elk calving season (April 15 to June 30).
    d. Timber harvest and prescribed burning may be used to improve wildlife habitat conditions. New roads needed for the removal of forest products would be kept to a minimum. New roads would be physically closed to public use following completion of forest management activities.
- Any subsequent management activities involving harvests of more than 250 MBF, construction of new access into roadless elk summer or fall range, or critical, crucial, or essential wildlife habitat would be coordinated with the Montana Department of Fish, Wildlife and Parks (MFWP).
- The approach used in developing the large scale salvage and restoration projects for the Bucksnort and Boulder Complex Wildfires of 2000 and the Landscape Analysis and South Elkhorn Implementation Project provides the framework for design and analysis of future emergency stabilization and forest restoration activities in other areas.
- Commercial forestland in areas with completed landscape analysis, the Boulder-Clancy, and the Marysville areas would be high priority for forest management. Special harvest restrictions would be applied in key elk seasonal use areas.

Riparian

Riparian and wetland areas would be in properly functioning conditioning or would be moving toward properly functioning condition. Properly functioning condition includes; the presence of all age classes (seedling, sapling, pole, mature, decadent, and dead) of tree and shrub species where the potential exists, diverse composition of vegetation, species that indicate maintenance of riparian soil moisture, riparian plants with high vigor, adequate vegetative cover to protect banks and dissipate energy during high flows, and plant communities to provide for large woody material in streams and riparian areas.



SMZ for a Forested Stream

BLM would continue to implement projects to restore and improve riparian areas and wetlands. Up to 30 acres of riparian areas would be treated by burning or mechanical means per decade to improve vegetative conditions. (This treatment figure is a continuation of what has occurred, however the current plan allows treatment in all riparian areas subject to other management constraints.) Opportunities would be identified to minimize impacts or enhance riparian and wetland resources during project planning. Existing livestock exclosures along streams, wetlands, and riparian areas would be maintained as long as needed to meet management objectives.

Management actions within floodplains and wetlands would include measures to preserve, protect, and, if necessary, restore their natural functions.

BLM would continue to evaluate wooded riparian communities when conducting rangeland health assessments.

Livestock Grazing

Livestock grazing would be allowed on about 278,000 acres. The amount of forage available on these lands would be 25,677 Animal Unit Months (AUMs). About 29,000 acres would not be available for livestock grazing. **Table 2-23** shows how the grazing availability in a number of allotments would vary by alternative. Grazing allotments are displayed on electronic maps (Grazing Allotment Map 1.PDF through Grazing Allotment Map 10.PDF) in the Grazing Allotment Maps folder on the enclosed compact disc. A table called Grazing Allotment Table.PDF, also enclosed in the same folder, can be used to cross-reference allotment numbers on the maps with allotment names in the table.

After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would become vacant and available to qualified applicants per the grazing regulations. These allotments would be administered like all other existing allotments.

The existing Indian Creek allotment (2,215 acres and 376 AUMs) would be expanded up to an additional 5,566 acres and 700 AUMs by the Iron Mask Acquisition. The Indian Creek allotment would be available to qualified applicants per the grazing regulations. This allotment would be administered like all other existing allotments.

The Medicine Rock (Northeast Helena) riparian area would remain closed to livestock grazing and would not be available for prescription livestock grazing (authorized grazing use designed to accomplish a specific purpose. Controlling noxious weeds by grazing goats would be an example).

Allotments where grazing preference is relinquished (an allotment where an existing permittee or lessee gives up his or her grazing preference causing the allotment to become unleased) would remain available for livestock grazing leases or permits.

To reduce the potential for interactions between wild and domestic sheep, existing Instruction Memorandum 98-140 (USDI-BLM 1998b) would be followed to protect wild sheep. To minimize physical contact between domestic and wild sheep, buffer strips would be identified between new sheep and goat allotments as well as for those allotments with conversions from cattle to sheep and goats. Buffer strips may not be necessary or may be smaller where topographic features or other barriers exist that minimizes contact between wild and domestic sheep. Buffer strips could range up to 9 miles but the size could vary as developed through a cooperative agreement.

Rest from livestock grazing in vegetation treatment areas would be determined through site-specific interdisciplinary planning and NEPA processes.

Forage and cover requirements would be incorporated into allotment management plans and would be specific to areas of primary wildlife use.

Applications for unleased allotments and vacant available lands would be considered on a case-by-case basis.

Wildland Fire Management

BLM would continue to manage vegetation under the Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas (USDI-BLM, 2003a). Fire management categories and associated treatment acreages under the No Action Alternative are presented in **Table 2-1** and **Map 2**.

Table 2-1
Alternative A Fire Polygons

FMU	Category[1]	BLM Acres[2]
Absoraka Foothills	C	3,900
Big Belt Mountain	C	7,200
Big Hole River Corridor	C	11,100
Blackfoot (See Missoula FO)	C	0
Boulder River	B	14,300
Clancy/ Marysville	C	28,200
Elkhorn Mountains	C	68,900
Fleecer Mountain	C	18,100
McCartney/ Rochester	C	28,100
North Hills	B	6,300
Pipestone	C	41,000
Scratchgravel Hills	B	7,900
Sleeping Giant/ Sheep Creek	C	20,500
Spokane Hills and North	B	6,800
Three Forks	C	31,200
Wise River Town site	B	1,400
Bozeman/Livingston Scattered Tracts	A	7,300

[1] Category and associated treatments only apply to BLM land within each zone.

[2] Acres are approximate and rounded to nearest 100.

BLM would continue to manage the fire program to control all wildland fires burning on or threatening public land within the first burning period. Modified fire suppression areas would continue to be based on values at risk, fire behavior, fire occurrence, beneficial fire effects including reduction of fuel loading, fire suppressions costs, and consistency with other agency plans and policies. Appropriate fire suppression actions would be implemented in the WUI and areas identified as possessing significant values that could be significantly altered by wildland fire.

Wildland fire use would continue to be allowed in areas identified as being acceptable in the Fire Management Plan, where there are approved wildland fire use plans

(Elkhorn Mountains), or upon completion of approved wildland fire use plans. The Elkhorn Mountains Fire Management Plan would be kept under current guidance.

Noxious Weed Management

All grazing allotment agreements for the Planning Area would continue to address weed control by chemical treatment and adjusting livestock use in response to reduced forage availability.

Weeds would continue to be treated near roads and trails, urban interface and recreation areas. Areas currently under a multi-year treatment plan would continue to be treated. Treatments would include a combination of cultural, chemical, and biological treatments for weed control.

Under Alternative A, the objective would be to treat an estimated 20,000 acres of weeds per decade, not including biocontrol measures such as insect releases, grazing, or use of pathogens.

Management Common to Action Alternatives (B, C, and D)

Grasslands and Shrublands

When necessary, sagebrush and grassland distribution and vigor would be restored through vegetative treatments such as reducing conifer encroachment, reducing noxious weeds, and ensuring proper grazing practices (season or use or intensity).

Management of sagebrush habitats will be a priority based on concerns over the conservation status of sage grouse, pygmy rabbit, and other species associated with sagebrush and grassland habitats.

The current acres of shrublands and grasslands shown by major watershed in **Table 2-23** at the end of this chapter are approximations with built-in limitations associated with distinguishing between these two habitat types during mapping. The current and proposed treatment acres of these two habitat types were separated to provide an indication of the relative amount of these habitats. However, due to the limitations in mapping these habitat types, the total number of shrubland and grassland acres proposed for treatment by alternative should be considered in combination. Objectives for proposed treatment acres include only those acres that would be treated to reduce conifer encroachment.

Under the action alternatives, an objective would be to treat up to 850 acres of crested wheatgrass seedlings, agriculture fields, and weed infestations in the McMasters and Ward Ranch acquisitions to convert their communities from non-native vegetation to native vegetation.

Forests and Woodlands

Forest and woodland health assessments would be incorporated into Land Health Standards at the activity plan level to determine forest health conditions in project areas. Forest health is defined as the degree to which the biological and physical components of forest stands and their associated ecosystems and relationships are present, functioning, and capable of self-renewal.

Natural disturbance regimes would be maintained or mimicked so that plant communities are resilient when periodic outbreaks of insects, disease, and wildland fire occur.

Vegetation planning would be coordinated with managers of federal or state lands adjacent to site-specific proposals for a collaborative approach.

Vegetation manipulation projects would be designed to minimize impacts to wildlife habitat and improve it when possible.

To maintain site productivity (organic matter and nutrients), provide for special wildlife features, and discourage cross-country motorized travel, much of the fine materials not utilized (seedlings, saplings, tops, and branches less than 4 inches in diameter, cull logs and identified down woody material) would be left scattered on the forest floor where it would not contribute to ladder fuels.

Forest management would emphasize old forest structures, snag management, and large diameter trees for cavity nesters where appropriate. Existing and developing old forests would be retained and protected from uncharacteristically severe natural disturbances such as; stand replacing wildland fire, and insect and disease epidemics.

The BLM would strive to maintain and/or restore stands with old forest structure within historic range of variability to maintain and/or enhance habitat for old growth dependent species.

BLM would design fire restoration/rehabilitation standards on a case-by-case basis, compatible with landscape resource management objectives and long-term (25-year) vegetation health protection and fuel management.

Forest and Woodland Products

In all action alternatives, commercial harvest of forest products would normally be associated with vegetative restoration (including forest health) and fuels treatments and would be designed to meet objectives for forest management, wildlife habitat management, fire hazard reduction, hazard tree removal, special status species management, visuals, recreation, and travel management.

Raw material for a variety of forest products would be made available in all alternatives.

Special forest and range products would be managed according to sustainability limits and where consistent with other resource management objectives. These products would be harvested under the appropriate written, BLM approved authorization only.

Residual stands left by disturbance events would be maintained to provide for natural regeneration and diversity of forest systems.

Riparian

Riparian areas would be managed to provide the amount and distribution of large, woody material characteristic of natural aquatic and riparian ecosystems. Trees may be felled in riparian areas when they pose a safety risk or are needed to enhance riparian function/condition. Felled trees would be kept on site when needed to meet woody debris objectives.

Riparian and wetland areas would be assessed and monitored for proper functioning condition and other specific objectives, by using proper functioning condition and/or other appropriate stream survey methodologies. For proper functioning condition in streams, entrenchment, width/depth ratio, sinuosity, channel substrate, and slope should be within the range identified for channel types.

BLM would cooperate with federal, tribal, and state wildlife management agencies and private landowners to identify activities that prevent meeting riparian standards. In cooperation with those agencies, projects or management measures would be designed to minimize impacts.

Mechanical or hand cutting and/or prescribed burning would be used to remove competing conifers from riparian ecosystems, including aspen clones. Commodity removal of juniper would be encouraged.

Livestock Grazing

For allotments without specific management objectives set through an interdisciplinary planning process, the utilization objective as measured at the end of the grazing season would be 55 percent on non-native seedlings and 45 percent on native herbaceous forage plants, on a pasture average basis. (These utilization percentages would maintain or enhance most plant communities found in the Decision Area to achieve or make progress toward meeting Rangeland Health Standards.) Lower or higher utilization objectives may be acceptable when set through an interdisciplinary planning or NEPA process to achieve resource objectives.

Grazing uses on lands proposed for acquisition would be considered on a case-by-case basis based on the values identified for the acquisition.

No new kind of livestock conversions from sheep or cattle to horses would be allowed on existing allotments smaller than 160 acres. No new horse permits or leases would be offered on available vacant parcels less than 160 acres in size. Exceptions may be granted in rare cases of intermingled ownership where rangeland health standards are met.

BLM would develop and implement appropriate grazing strategies in grizzly bear distribution zones.

Wildland Fire Management

Any wildland fire that is eligible for Wildland Fire Use (WFU) will require a site-specific Wildland Fire Implementation Plan (WFIP) before it can be managed as such.

Fire Management Unit (FMU) boundaries are based on watershed boundaries. In each action alternative more FMUs are created within the watershed boundaries to take in consideration for known areas of wildland urban interface.

Priority of fire management activities would be placed on fuels reduction in WUI areas in conjunction with completed Community Wildfire Protection Plans.

Fire management activities outside of the WUI areas would use Fire Regime, Condition Class (FRCC) to determine level of fuels treatments.

Fire management would focus on maintaining fire dependent ecosystems and restoring or maintaining those areas outside their natural balance through mechanical, chemical, and/or prescribed fire treatments.

For all prescribed fire projects, BLM would evaluate habitat type, soils, fuel conditions, project objectives, and risk when determining seasonality for burning.

Spread of non-native invasive aquatic species as well as additional resource values would be addressed in the Butte Field Office Fire Management Plan to be revised after finalization of this RMP.

Noxious Weed Management

Noxious weed control using domestic sheep and/or goats in occupied bighorn sheep habitat would be prohibited.

Treatments using biological controls (including but not limited to grazing, insect releases, and pathogens) which have been documented to damage existing desired plant or wildlife species would be prohibited.

BLM would actively conduct noxious weed outreach and education for BLM personnel, public land users, and the general public. Outreach and education would consist of identification, prevention and control methods, and the benefits of restoration.

BLM would encourage the development of weed management areas where the landowners and users are cooperatively working to manage noxious weeds within designated areas.

Where applicable, plant communities would be restored to promote resistance to weed invasion, using accepted management techniques, methods, and procedures.

All contractor and BLM equipment would be power-washed to remove weed seed before entering ground disturbing project areas.

Alternative B – Preferred Alternative

Grasslands and Shrublands

Priority areas for treatment would include big game winter range, sagebrush, bighorn sheep habitat, and the Wildland Urban Interface.

Objectives for treating grasslands and shrublands under Alternative B are as follows. The total amount of grassland proposed for conifer reduction per decade would be 2,750 to 11,800 acres. The total amount of shrubland proposed for conifer reduction per decade would be 1,000 to 3,650 acres. These acres are displayed by major watershed in **Table 2-23**.

Native or low impact, non-invasive seed mixtures would be used when restoring vegetation on disturbed ground.

Forests and Woodlands

For the action alternatives, Forests and Woodlands are further subdivided into dry forest types, cool and moist forest types, late and old structure forest, while forest products includes a subheading for timber salvage.

Dry Forest Types

The objective for total amount of dry forest treatments per decade under Alternative B would be 4,150 to 14,750 acres. These acres are displayed by major watershed in **Table 2-23**.

Restoration priorities would include dry forests with medium to large sized trees, with high tree densities. In dense, old, and mature Douglas-fir and ponderosa pine forests, stand density would be moved toward stands that consist of fewer trees per acre with a larger average diameter. Over time, treatments would produce a variety of stands with more open canopies of multiple age groups of native conifers and healthy and more diverse shrub, grass, and forb understories. A range of 3,350 to 10,750 acres per decade of medium to large sized tree-dominated stands of this forest type would be treated under Alternative B (subset of objective for total acreage treatments). Historically, these habitat types were more open "savannah" forests interspersed with grassland and shrubs. Dry forest stands that are in an ecologically "healthy" condition which can sustain the growth of the larger trees while successfully reproducing and maintaining the juvenile growth of the younger trees would also be maintained under Alternative B. Treatments would promote the large, overstory trees and natural regeneration that would provide diverse age and size classes. Maintenance of existing dry forests would be considered "moderate priority" with 400 to 2,000 acres per decade anticipated for treatment (subset of objective for total acreage treatments).

Under Alternative B, these treatments could also include thinning in limber pine, dry forest habitats amounting to approximately 100 to 1,000 acres per decade, and approximately 300 to 1,000 acres per decade of small diameter thinning of seedling/sapling and pole sized conifer stands.

The majority of ponderosa pine, dry forest treatments would occur in the Upper Missouri Watershed.

Cool and Moist Forest Types

Cool and moist forest types would be treated when necessary to maintain or improve stand conditions. Restoration of these habitat types may also be done to meet desired future conditions for ecosystem function and diversity as well as for wildlife habitat including creating forage for lynx in lodgepole pine forests.

The objective for total amount of cool and moist forest treatments per decade under Alternative B would be 450 to 3,750 acres. These acres are displayed by major watershed in **Table 2-23.**

Approximately 350 to 3,350 acres of stands dominated by medium to large sized trees, with high tree density in cool and moist forest would be treated in this alternative (subset of objective for total acreage treatments). Small diameter thinning would also occur on approximately 100 to 400 acres per decade in seedling/sapling and pole size cool and moist Douglas-fir and lodgepole pine forests.

Treatments in cool and moist forest types would include the creation of openings to allow for regeneration of lodgepole pine and Douglas-fir. Areas may also be pre-commercial or commercially thinned. Commercial products such as timber and biomass would be produced from these treatments.

Treatment in cool and moist forest types would be considered a low to moderate priority under Alternative B. The priority watershed for implementation of treatments in cool and moist forest is the Big Hole.

Old Forest Structure

Alternative B would provide direction to maintain and promote old forest structure and conditions through active treatments and restoration activities. Actions would be designed to develop and maintain stand structures that are relatively complex with highly variable tree densities, healthy and diverse understory composition, and abundant snags and downed logs. Where deficient on the landscape, snags and down woody material would be created in appropriate areas.

Forest and Woodland Products

The objective for quantities of forest products (PSQ) are based on the expected amount of treatment acres (including the WUI projects) and would be 33,000 to 91,000 CCF or 9 to 25 MMBF per decade under Alternative B.

Some new permanent roads may be built for long-term management of areas where multiple entries would be necessary to meet objectives. New and temporary road construction would be kept to a minimum. Temporary roads would be decommissioned (route would be closed and rehabilitated to eliminate resource impacts such as erosion, and is no longer useable for public or administrative uses) within one year of project completion. In addition, replacement, maintenance, or decommissioning of existing roads to meet transportation planning and management objectives could also occur during forest product removals or stewardship treatment projects conducted under Alternative B.

The small sale program (estimated quantities of permits and products shown in **Table 2-23)** would maintain the current types of activities as well as the development of treatment areas to help meet public demand for small sale products. The small sales would only occur where sufficient physical access currently exists. No new permanent roads would be constructed to meet the demands of the small sale program.

Personal use firewood permits valid for wood collection from both BLM and Forest Service lands in Western Montana would continue to be offered by BLM in cooperation with the Forest Service.

Unless specifically designated, only standing dead and dying wood would be allowed to be taken as firewood. The BLM, however, could designate specific areas for firewood cutting of live trees to meet other resource objectives or BLM authorized uses such as leases and rights-of-way.

To protect existing snag habitat for wildlife, no dead trees greater than 24 inches DBH would be allowed to be cut for firewood. Firewood cutting would not be allowed in WSAs.

Firewood cutting would not be allowed within 100 feet of live (yearlong flow) streams or within 50 feet of intermittent streams.

Timber Salvage

Numerous bird and mammal species require dead and dying forests for maintenance of viable populations. Methods of salvage that "homogenize" a stand such as selective removal of all trees of a certain size (usually a size required by disturbance dependant species), density and/or species would not maintain the structure or variety of microclimates required by bird and mammal species that use this type of habitat. When salvage is proposed in dead and dying forests, contiguous acres of undisturbed standing and down woody material would be retained in adequate amounts for those wildlife species that depend on this type of habitat.

Outside of the contiguous areas identified for retention, harvest treatments may include: 1) forest openings appropriate for the site and retention patches of uncut dead and dying trees; or 2) forest openings appropriate for the site with selective thinning between openings and retention patches of uncut dead and dying trees; or 3) selective thinning and retention patches of uncut dead and dying trees.

Bark beetle suppression treatments, which may target large tree removal, would be permitted to contain outbreaks and to reduce the risk to other forest stands in the vicinity.

Riparian

At the Field Office scale, Alternative B would maintain, protect, and/or restore aquatic and riparian-dependent terrestrial resources. The emphasis in Alternative B would be to actively restore riparian habitats.

Riparian Management Zones (RMZs)

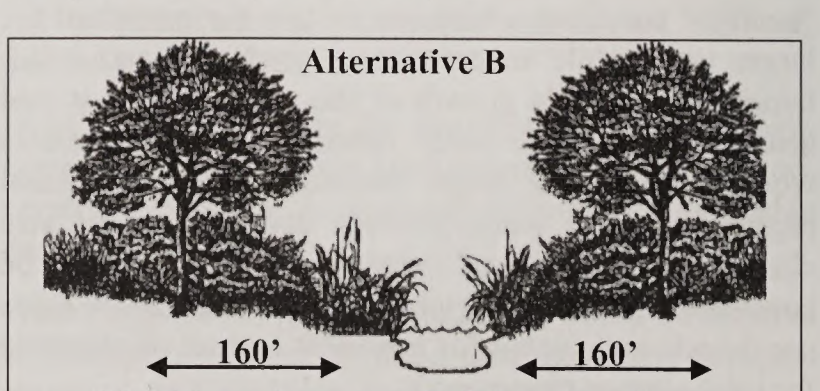
Riparian Management Zones are areas where riparian values would receive primary emphasis with all activities to the extent possible. Maintaining and restoring quality riparian habitat (including vegetation) is important for many wildlife species as well as to maintain water quality, appropriate woody material, and nutrient routing to aquatic habitats, and to maintain appropriate stream channel morphology.

Riparian Management Zones are intended to: maintain and restore riparian structures and functions; benefit fish and riparian-dependent resources; enhance conservation of organisms that depend on the transition zone between upslope and aquatic habitats; and improve connectivity of travel and dispersal corridors for terrestrial animals and plants, and aquatic organisms.

In addition to adhering to SMZ Law, Riparian Management Zones from the edge of the aquatic habitat would be established as follows.

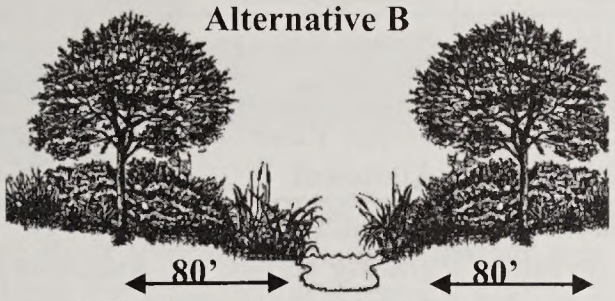
Forested Areas

Streams, lakes, ponds, and reservoirs containing fish: The riparian management zone (RMZ) would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel, full pool, or adjacent wetland a distance equal to the height of two site-potential trees. (Site potential tree height – within forested areas, a site potential tree height would be the average maximum potential height of dominant trees, in the riparian management zone).



RMZ for a Forested, Fish bearing Stream
Assumes an 80' height site potential tree

Perennial non-fish bearing streams: The RMZ would consist of the stream and a zone located on both sides of the channel. This zone would extend from the outer edges of the bankfull channel (or adjacent wetland) a distance equal to one site-potential tree height.



RMZ for a Forested, Perennial, Non-Fish bearing Stream
Assumes an 80' height site potential tree

Non-fish bearing ponds, lakes, reservoirs, or wetlands greater than 1 acre: The RMZ would extend from the outer edge of the full pool or wetland a distance equal to one site-potential tree height or to the edge of seasonally saturated soil or wetland vegetation, whichever is greater.

Intermittent streams and wetlands less than 1 acre: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel or adjacent wetland a distance equal to at least 50 feet.

Non-forested Areas

For fish-bearing and non-fish bearing streams, lakes, ponds, and reservoirs, the RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel (average high-water mark), full pool, or adjacent wetland a distance that encompasses the active floodplain. The RMZ would extend 50 feet above the break in slope leading down from the lowest terrace to the floodplain, or in segments where trees are present, to a distance equal to one site-potential tree height from the edge of the feature, whichever is greatest.



RMZ for a Non-Forested, Perennial Stream

For intermittent streams and wetlands less than 1 acre, RMZs would be 50 feet from the edge of wetland vegetation or active stream channel as indicated by riparian vegetation, saturated soil, or water. The criteria for selecting the width may be different for each side of the water body. Riparian livestock use and vegetative treatment would occur under Alternative B within RMZs. The condition and importance of riparian resources to natural systems locally would serve as primary emphasis for management activities and uses. At the Field Office scale, projects in RMZs would generally be designed to protect or restore the ecological function of riparian areas and streams.

Because stream types and riparian functions significantly vary across the Planning Area, RMZs based on a minimum linear distance would not be applicable for every project. Although the minimum distances would always apply, the width necessary to protect the stream and riparian structure and function may be wider than the minimum distances and would be determined from site-specific analysis.

Each project would incorporate specific design features to maintain the key ecological function of the Riparian Management Zones.

The objective for total amount of riparian vegetation habitat proposed for mechanical and/or prescribed burning treatments per decade under Alternative B would be 200 to 700 acres (this includes vegetative treatments and not changes in grazing practices). These acres are displayed by major watershed in **Table 2-23**.

Commercial timber harvest would be allowed in Riparian Management Zones to meet riparian restoration or maintenance objectives and only if adequate woody material remains in the riparian area to meet site-specific (project level) riparian objectives.

Where the primary project objective is aspen restoration, treated aspen stands would be fenced from livestock and wildlife when recovery could be suppressed by grazing and browsing. Fencing could consist of using native, on-site materials as barriers. All fences (with the exception of barriers created from native, on-site materials) would be maintained and removed within 10 years or when the aspen is fully re-established or recovered.

Livestock Grazing

Livestock grazing would be allowed on about 270,000 acres of public land. Approximately 37,000 acres of public land would be unavailable for grazing permits or leases (**Table 2-2**). (The allotments unavailable for grazing permits are unleased at this time generally because they lack forage or water, are small, are on steep terrain, are covered with timber, are adjacent to subdivisions, or lack infrastructure.) The amount of forage available on these lands would be 24,710 AUMs active use and 1,312 AUMs forage reserve, temporary non-renewable AUMs.

After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would be established as forage reserve allotments (An allotment without a term grazing permit that is grazed on a temporary nonrenewable basis. This type of allotment

Table 2-2
Grazing Availability For Special Allotments Varying By Alternative

Allotment Name	Allotment Number	Alt. A	Alt. B	Alt. C	Alt. D
Indian Creek	20233	Available for grazing permit	Forage Reserve Allotment	Unavailable for grazing permit	Available for grazing permit
Spokane Hills	7720	Available for grazing permit	Forage Reserve Allotment	Forage Reserve Allotment	Available for grazing permit
McMasters Hills	7721	Available for grazing permit	Forage Reserve Allotment	Forage Reserve Allotment	Available for grazing permit
Centennial Gulch	7715	Available for grazing permit	Unavailable for grazing permit; prescription grazing	Unavailable for grazing permit; no prescription grazing	Available for grazing permit
Free Coinage	20254	Available for grazing permit	Unavailable for grazing permit	Unavailable for grazing permit	Available for grazing permit
Alder Creek	351	Available for grazing permit	Unavailable for grazing permit	Unavailable for grazing permit	Available for grazing permit
Charcoal Mountain Cust.	10363	Available for grazing permit	Unavailable for grazing permit	Unavailable for grazing permit	Available for grazing permit
Dickie	20364	Available for grazing permit	Unavailable for grazing permit	Unavailable for grazing permit	Available for grazing permit
Dog Paw	20365	Available for grazing permit	Available for grazing permit	Unavailable for grazing permit	Available for grazing permit
Maiden Rock Custodial	20367	Available for grazing permit	Unavailable for grazing permit	Unavailable for grazing permit	Available for grazing permit
Quinn Creek	5487	Available for grazing permit	Unavailable for grazing permit	Unavailable for grazing permit	Available for grazing permit
Sixmile Park County	5507	Available for grazing permit	Available for grazing permit	Unavailable for grazing permit	Available for grazing permit
Wineglass Mountain	15452	Available for grazing permit	Unavailable for grazing permit	Unavailable for grazing permit	Available for grazing permit

would be used to provide temporary grazing to rest other areas following wildfire, habitat treatments, or to allow for more rapid attainment of rangeland health). Forage reserve allotments would be managed to meet, or move toward meeting, land health standards. Use would be authorized on a temporary, nonrenewable basis. The amount of use would be determined by the BFO. Applicants would be required to meet qualifications per the grazing regulations, and show the ability and commitment to repair and maintain improvements and infrastructure. The BFO would rank qualified applicants according to the following criteria in priority order:

1. Implementing projects or vegetation management on BLM lands.
2. Facilitating a change in management to improve resource conditions on BLM allotments.
3. Accommodating permittees or lessees displaced by natural causes (i.e. wildland fire, drought, insect infestations, etc.)

The criteria found at 43 CFR §4130.1-2 (USDI-BLM 2006a) will be used to determine priority when conflicting applications are submitted.

The existing Indian Creek allotment would be expanded up to 5,566 additional acres and 700 AUMS by the Iron Mask acquisition. The allotment located in the Elkhorns Cooperative Management Area would be managed as a forage reserve allotment. The allotment would be managed to meet, or move toward meeting, land health standards. Use would be authorized on a temporary, nonrenewable basis. The amount of use would be determined by the BFO. Applicants would be required to meet qualifications per the BLM grazing regulations, and show the ability and commitment to repair and maintain improvements and infrastructure. The BFO would rank qualified applicants according to the following criteria in priority order:

1. Be a State or Federal permittee or lessee, or private landowner within the boundaries of the Elkhorns Cooperative Management Area (ECMA).

2. Implementing projects or vegetation management on ECMA lands.
3. Facilitating a change in management to improve resource conditions on ECMA lands.
4. Accommodating permittees or lessees displaced by natural causes (i.e. wildland fire, drought, insect infestations, etc.)
5. The criteria found at 43 CFR §4130.1-2 (USDI-BLM 2006a) when conflicting applications are submitted.

The Centennial Gulch (Ward Ranch) allotment and Medicine Rock (Northeast Helena) riparian area would be available for prescription livestock grazing to meet specific resource objectives as determined through a site-specific interdisciplinary planning and NEPA process.

Allotments where grazing preference is relinquished would be evaluated for suburban/urban interface issues, critical wildlife habitat, riparian values, or recreational considerations before re-offering the grazing preference on the allotment for permit or lease.

Areas identified for prescribed burning would be rested from livestock grazing up to one year prior to treatment, if necessary, to produce fine fuels to carry the burn. Treatment areas would be rested for a minimum of two growing seasons following treatment to promote recovery of vegetation. Livestock rest for more or less than two growing seasons could be justified on a case-by-case basis.

Range projects would be maintained as long as needed to meet management objectives. Maintenance would be assigned to grazing permittees, other authorized public land users, or the BLM. Routine maintenance would be completed according to the maintenance schedule per the terms and conditions of existing cooperative agreements.

Under Alternative B, no change in livestock conversions from cattle to domestic sheep or goats would be allowed in allotments within occupied wild sheep habitat. New sheep and goat allotments or conversions from cattle to sheep or goats would be permitted a minimum of 5 miles from known bighorn sheep habitat. This distance would be greater if deemed necessary through site-specific analysis or a cooperative agreement with other federal or state agencies. Goats and sheep could be used for weed control on winter ranges when wild sheep are absent. To minimize contact with bighorn sheep, domestic sheep, and goats used for weed control would only be allowed to graze for up to 1 month near occupied bighorn sheep habitat and there would be a minimum buffer of 2 miles between domestic and wild sheep. Bedding grounds would be a minimum of 4 miles from known bighorn sheep habitat. The use of domestic sheep and goats would only be allowed from May 1 to July 31 unless coordinated with MFWP. A herder would be required to be on site at all times and be able to communicate with the BLM, the herd owner and MFWP. If bighorn sheep and domestic sheep and goats come into contact, the herder would be required to contact the BLM and MFWP immediately.

Wildland Fire Management

BFO administered lands would be broken into nine FMUs. The FMUs would have B and C designations applied. Approximately 52,000 acres would be designated in category B and 255,000 acres in Category C (**Table 2-3** and **Map 3**). The FMUs follow watershed boundaries with the following two exceptions: The Missouri and the Big Hole watersheds would each be broken into two FMUs due to the urban interface areas surrounding Helena and Wise River. The Missouri watershed FMUs would be Central Missouri and Missouri, and the Big Hole watershed FMUs would be Big Hole and Wise River.

Table 2-3
Alternative B Fire Polygons by Watershed

FMU	Category[1]	BLM Acres[2]
Big Hole	C	51,000
Blackfoot	B	1,000
Central Missouri	B	37,000
Gallatin	B	2,000
Jefferson	C	82,000
Missouri	C	115,000
Upper Clark Fork	B	1,000
Wise River	B	10,000
Yellowstone	C	8,000

[1]Category and associated treatments only apply to BLM land within each zone.

[2]Acres are approximate and rounded to nearest 1000.

Fire management activities would correspond to the FMU designations. Management-ignited prescribed fire would not be conducted between May 1st and August 30th to protect nesting migratory birds unless breeding bird surveys document low potential impact to breeding birds.

In grassland and shrubland habitats, BLM would plan for prescribed burns that do not consume above-ground vegetation on more than 80 percent (on average) of each unit by surface area.

Delivery of chemical retardant, foam or additives to live streams would be avoided. Fish screens (1/8 inch diameter holes) on hoses would be required when removing water from fish bearing streams during fire management activities. Maps of fish bearing streams would be included in the BFO Fire Management Plan for use in initial attack of wildland fires.

Noxious Weed Management

In addition to the priorities identified under Management Common to All Alternatives, prevention and control of

weed infestations in special designation areas and Weed Management Areas (areas with agreements between landowners to cooperatively manage for weeds) would be a high priority under Alternative B.

Under Alternative B, the objective would be to treat an estimated 21,000 to 50,000 acres of weeds per decade, not including biocontrol measures such as insect releases, grazing, or use of pathogens.

To minimize the risk of inadvertently spraying desirable riparian vegetation and waterways, aerial spraying of herbicides or pesticides would not occur when eye-level winds are greater than 6 miles per hour or within a minimum of 100 feet from streams or wetlands or in occupied or high value habitat for sensitive species of plants or animals. Aerial spraying would be conducted in a way that minimizes the effects on native forbs, grasses, and shrubs. Additionally, no herbicides or pesticides which may negatively affect sagebrush would be used aerially in sensitive sagebrush habitats. Standard operating procedures described in the Record of Decision for the Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement would be used.

To prevent special status plants from being sprayed with herbicides, BLM, county, and contractor personnel participating in weed treatment activities would be provided with training to identify special status plants and maps of special status plant populations associated with weed treatment areas.

Outreach/education on noxious weeds would be provided to the public at campgrounds and trailheads.

Alternative C

Grasslands and Shrublands

Priority areas for treatment would include big game winter range, Wildland Urban Interface, and current sage grouse habitat.

Objectives for grassland and shrubland treatments under Alternative C are as follows. The total amount of grassland proposed for conifer reduction per decade would be 1,250 to 2,000 acres. The total amount of shrubland proposed for conifer reduction per decade would be 250 to 750 acres. These acres are displayed by major watershed in **Table 2-23**.

Only native seed species would be used in restoring vegetation on disturbed ground.

Forests and Woodlands

Dry Forest Types

Compared to the other action alternatives, the management emphasis would be on treating smaller areas than in the other alternatives and allowing for more "natural" disturbances across the landscape. Stand density would be higher and average diameter of trees would be generally be smaller under this alternative than with Alternatives A, B, or D. Alternative C would treat fewer acres than the other alternatives.

The objective for total amount of dry forest treatments per decade under Alternative C would be 2,050 to 4,800 acres. These acres are displayed by major watershed in **Table 2-23**.

The emphasis for restoration would be the same as Alternative B and D with focus on dry forests that have medium to large sized trees and have high tree density. A range of 2,050 to 4,800 acres per decade would be treated (subset of objective for total acreage treatments). As with Alternatives B and D, vegetative treatments would also open up stands of dry Douglas-fir and ponderosa pine with multiple canopy layers and a diverse grass and shrub understory. Dry forest stands that are currently in an ecologically "healthy" condition would be protected from land management actions that would degrade this forest type but very few acres would be maintained under Alternative C. Maintenance of existing dry forest habitat types would be considered "low priority" and fewer than 500 acres per decade would be expected to be treated (subset of objective for total acreage treatments).

Cool and Moist Forest Types

Cool and moist forest types would be treated when necessary to maintain or improve stand conditions but treatments would be less under Alternative C than the other action alternatives, but more than in Alternative A.

Treatment of cool and moist forest types would be considered a low priority under Alternative C. Treatments in cool and moist forest types would include the creation of small openings (10 acres or smaller) to allow for regeneration of lodgepole pine, Douglas-fir, subalpine fir or spruce. Areas may also be pre-commercial or commercially thinned.

The objective for total amount of cool and moist forest treatments per decade under Alternative C would be 50 to 550 acres. These acres are displayed by major watershed in **Table 2-23**.

Approximately 50 to 500 acres per decade of medium to large, high density cool and moist forest would be treated in this alternative (subset of objective for total acreage treatments). Small diameter thinning would also occur on up to 50 acres per decade in seedling/sapling and pole size Douglas-fir and lodgepole pine forests.

Old Forest Structure

Alternative C would maintain and protect old forest structure and condition. Stands with old forest structure would be protected to maintain stand structures that are relatively complex with highly variable tree densities, healthy and diverse understory composition, and abundant snags and downed logs. Few snags and little down

woody material would be proactively recruited in Alternative C.

Forest and Woodland Products

The objective for Probable Sale Quantity under Alternative C would be 19,000 to 41,000 CCF or 5 to 12 MMBF per decade. Forest treatments would occur in areas already accessible by the current road system, although helicopter logging may be feasible in difficult to access areas. No new permanent roads would be constructed, and temporary road construction would be kept to a minimum. Temporary roads would be decommissioned within one year of project completion.

The small sale program (estimated quantities of permits and products shown in **Table 2-23)** would maintain the current types of activities but small sale activities involving medium to large trees would be restricted to areas where materials need to be removed due to authorizations such as rights-of-ways, road use agreements, grazing leases, and free use of materials by other agencies and charitable organizations.

Removal of standing dead or down trees or dead woody material for commercial or personal use firewood purposes would be authorized only in designated areas, and the personal use firewood permit currently issued by the BLM and USDA Forest Service for firewood gathering on either public or national forest lands would be dropped.

The BLM would designate areas where live trees could be taken as firewood to meet other resource objectives. No live trees greater than 20 inches DBH would be allowed to be removed as firewood. Firewood cutting would not be allowed in WSAs.

Firewood cutting would not be allowed within 200 feet of live (yearlong flow) streams or within 100 feet of intermittent streams.

Timber Salvage

Where contiguous acres of dead and dying forest exceed 1,000 acres, 50 percent of the area would be maintained as retention. Harvest treatments within the remaining project area may include: 1) creation of forest openings, 2) selective thinning between openings and 3) 50 percent total retention across the harvest treatment area.

Riparian

The emphasis in Alternative C would be placed on coordinating and integrating riparian restoration objectives through other high priority projects. When possible, the restoration and enhancement of aspen, cottonwood, willows, or other riparian dominant species would also be incorporated into other projects in the vicinity of riparian habitats. Riparian communities, including aspen clones, would be maintained, restored, or enhanced to provide vegetative diversity and structure of riparian areas and to benefit wildlife.

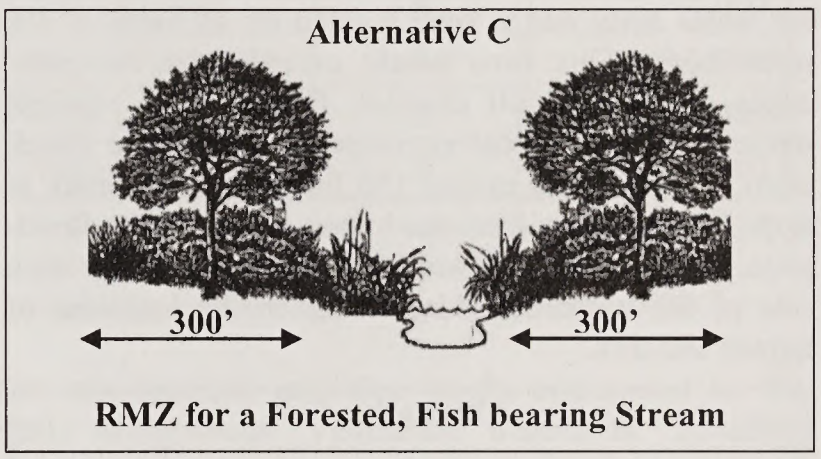
Riparian habitat would be opportunistically treated through other high priority forest and grassland treatments.

Riparian Management Zones

The Montana Streamside Management Zone Law would be followed. In addition to adhering to SMZ Law, Riparian Management Zones from the edge of the aquatic habitat would be established as follows:

Forested Areas

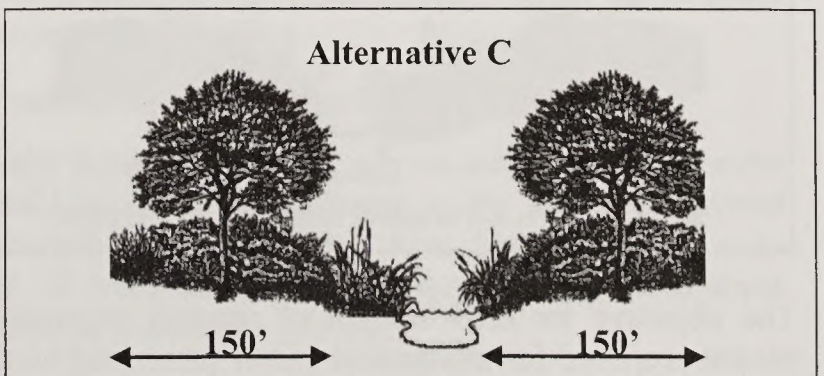
Streams, lakes, ponds, and reservoirs containing fish: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel, full pool, or adjacent wetland a distance equal to the top of the inner gorge, the outer edge of the 100-year floodplain, or 300 feet slope distance, whichever is greatest.



RMZ for a Forested, Fish bearing Stream

Perennial non-fish bearing streams – The RMZ would consist of the stream and a zone located on both sides of the channel. This zone would extend from the outer edges of the bankfull channel (or adjacent wetland) a distance equal to the top of the inner gorge, the outer edge of the 100 year floodplain, or 150 feet slope distance whichever is greatest.

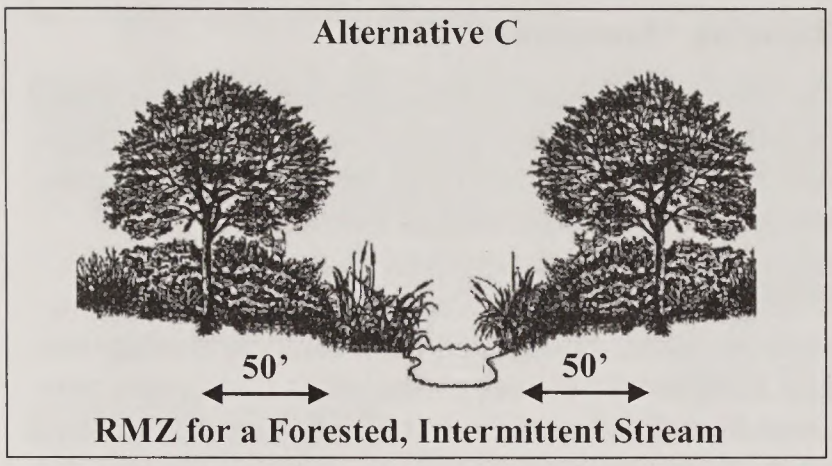
Non-fish bearing ponds, lakes, reservoirs, or wetlands greater than 1 acre: The RMZ would extend from the outer edge of the full pool or wetland a distance of 150 feet slope distance. This area would also include all moderately and highly unstable areas.



RMZ for a Forested, Perennial, Non-Fish bearing Stream

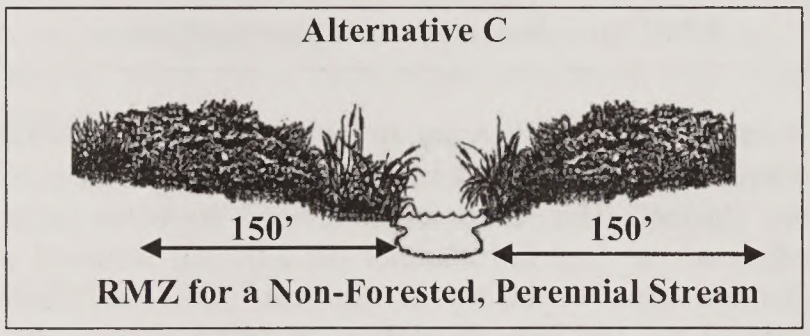
Intermittent streams and wetlands less than 1 acre: The RMZ would consist of the water body and a zone lo-

cated on all sides of the water body. This zone would extend from the outer edges of the bankfull channel or wetland at least 50 feet slope distance.

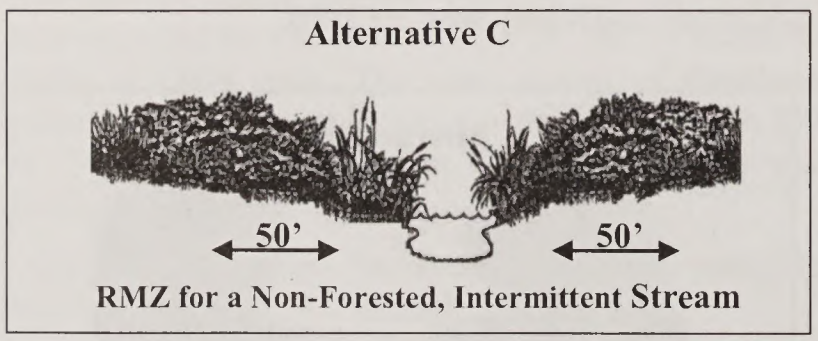


Non-forested Areas

Perennial fish-bearing and non fish-bearing streams or wetlands larger than 1 acre: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel, full pool, or adjacent wetland a distance that encompasses the active floodplain. RMZs would extend 150 feet above the break in slope leading down from the lowest terrace to the floodplain. The actual RMZ width may be different for each side of the water body depending on the locations of terrace features.



Intermittent streams and wetlands less than 1 acre: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel or wetland at least 50 feet slope distance.



The objective for total amount of riparian vegetation habitat proposed for mechanical and/or prescribed burning treatments per decade under Alternative C would be 75 to 200 acres (this includes vegetative treatments and not changes in grazing practices). These acres are displayed by major watershed in **Table 2-23**.

No commercial timber harvest would be allowed in RMZs. All woody material cut for restoration activities would be retained on site. If an adequate amount of down woody material exists, material may be removed for other riparian or stream restoration activities.

Under Alternative C, the structure and composition of aspen stands would be determined by natural processes or treated opportunistically through other projects. Treated aspen stands would be fenced from livestock grazing and, if necessary, wildlife grazing, and browsing. There would be an emphasis on using native, on-site materials for "natural" barriers. All fences (with the exception of native barriers) would be maintained and removed within 10 years or when the aspen is fully re-established or recovered.

Livestock Grazing

Livestock grazing would be allowed on about 262,000 acres of public land. Approximately 45,000 acres of public land would be unavailable for grazing permits or leases (**Table 2-23**). The amount of forage available on these lands would be 24,710 AUMs active use and 936 AUMs forage reserve, temporary non-renewable AUMs.

After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would be established as forage reserve allotments as in Alternative B.

The existing Indian Creek allotment (2,215 acres and 376 AUMs) as well as any lands acquired from the Iron Mask acquisition would be unavailable for grazing lease or permit.

The Centennial Gulch (Ward Ranch) allotment and Medicine Rock (Northeast Helena) riparian area would be unavailable for prescription livestock grazing.

After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would be established as forage reserve allotments (An allotment without a term grazing permit that is grazed on a temporary nonrenewable basis. This type of allotment would be used to provide temporary grazing to rest other areas following wildfire, habitat treatments, or to allow for more rapid attainment of rangeland health). Forage reserve allotments would be managed to meet, or move toward meeting, land health standards. Use would be authorized on a temporary, nonrenewable basis. The amount of use would be determined by the BFO. Applicants would be required to meet qualifications per the grazing regulations, and show the ability and commitment to repair and maintain improvements and infrastructure. The BFO would rank qualified applicants according to the following criteria in priority order:

1. Implementing projects or vegetation management on BLM lands.
2. Facilitating a change in management to improve resource conditions on BLM allotments.

3. Accommodating permittees or lessees displaced by natural causes (i.e. wildland fire, drought, insect infestations, etc.)

The criteria found at 43 CFR §4130.1-2 (USDI-BLM 2006a) when conflicting applications are submitted.

Areas identified for prescribed burning would be rested from livestock grazing up to one year prior to treatment, if necessary, to produce fine fuels to carry the burn. Treatment areas would be rested at a minimum of two full years following treatment to promote recovery of vegetation. Guidelines for residual ground cover would be developed in new Allotment Management Plans. Forage utilization would be monitored.

Currently existing exclosures would be maintained free of livestock grazing. Exclosures would be maintained annually before livestock turnout and would be monitored to compare differences between areas grazed and ungrazed by livestock.

Existing livestock exclosures along streams, wetlands, and riparian areas would be maintained as long as needed to meet management objectives. Maintenance of exclosures would be assigned to grazing permittees or other authorized public land users.

Under Alternative C, no change in livestock conversions from cattle to domestic sheep or goats would be allowed in allotments within occupied wild sheep habitat. New sheep and goat allotments or conversions from cattle to sheep or goats would be permitted a minimum of 9 miles from known bighorn sheep habitat. This distance would be greater if deemed necessary through site specific analysis or a cooperative agreement with other federal or state agencies. Goats and sheep could be used for weed control on winter ranges when wild sheep are absent. To minimize contact with bighorn sheep, domestic sheep, and goats used for weed control would only be allowed to graze for up to two weeks near occupied bighorn sheep habitat and there would be a minimum buffer of 4 miles between domestic and wild sheep. Bedding grounds would be a minimum of 6 miles from known bighorn sheep habitat. The use of domestic sheep and goats would only be allowed from May 15 to July 15 unless coordinated with MFWP. A herder would be required to be on site at all times and be able to communicate with the BLM, the herd owner and MFWP. If bighorn sheep and domestic sheep and goats come into contact, the herder would be required to contact the BLM and MFWP immediately.

Wildland Fire Management

BFO administered lands would be broken into ten FMUs. The FMUs would have A, B and C designations applied. Approximately 41,000 acres would be designated in category A; 23,000 acres in category B; and 243,000 acres in category C (**Table 2-4** and **Map 4**). The FMUs follow watershed boundaries with the following two exceptions: the Missouri watershed would be broken into three FMUs (Missouri, Central Missouri, and NW Missouri) and the Big Hole watershed would be broken into two FMUs (Big Hole and Wise River) due to the urban interface areas surrounding Helena and Wise River.

Table 2-4
Alternative C Fire Polygons by Watershed

FMU	Category[1]	BLM Acres[2]
Big Hole	C	60,000
Blackfoot	A	1,000
Central Missouri	A	37,000
Gallatin	A	2,000
Jefferson	C	82,000
Missouri	C	101,000
NW Missouri	B	14,000
Upper Clark Fork	B	1,000
Wise River	A	1,000
Yellowstone	B	8,000

[1]Category and associated treatments only apply to BLM land within each zone.

[2]Acres are approximate and rounded to nearest 1000.

Fire management activities would correspond to the FMU designations. Vegetation treatments, including management-ignited prescribed fire and mechanical treatments would not be conducted between May 1st and August 30th to protect nesting migratory birds unless breeding bird surveys document low potential impact to breeding birds. In grassland/shrubland habitats, BLM would plan for prescribed burns that do not consume aboveground vegetation on more than 60 percent (on average) of each unit by surface area.

Use of chemical retardant foam, or additives over live streams would only be allowed if there were a risk to human life and safety. Fish screens (1/8 inch diameter holes) on hoses would be required when removing water from fish bearing streams during fire management activities. Maps of fish bearing streams would be developed in the BFO Fire Management Plan for use in initial attack of wildland fires.

Noxious Weed Management

Under Alternative C, less aggressive weed management would be needed in response to the decreased ground disturbance in the Decision Area. Suppression and control of weed infestations in special designation areas would be a moderate priority.

The objective under Alternative C would be to treat an estimated 16,000 to 38,000 acres of weeds per decade, not including biocontrol measures such as insect releases, grazing, or use of pathogens.

Aerial spraying of herbicides or pesticides would not occur.

To prevent special status plants from being sprayed with herbicides, BLM personnel would be provided with maps of special status plant populations associated with weed treatment areas.

Outreach/education on noxious weeds would be provided to the public at campgrounds and trailheads.

Alternative D

Grasslands and Shrublands

Priority areas for treatment would include big game winter range, Wildland Urban Interface and current and historic sagebrush habitat, forest meadows and parks, and bighorn sheep habitat.

Objectives for treating grasslands and shrublands under Alternative D are as follows. The total amount of grassland proposed for conifer reduction per decade would be 5,500 to 19,050 acres. The total amount of shrubland proposed for conifer reduction per decade would be 1,850 to 6,800 acres. These acres are displayed by major watershed in **Table 2-23.**

As in Alternative B, native or low impact, non-invasive seed mixtures would be used when restoring vegetation on disturbed ground.

Forests and Woodlands

Dry Forest Types

The objective for total amount of dry forest treatments per decade under Alternative D would be 7,300 to 18,200 acres. These acres are displayed by major watershed in **Table 2-23**.

As with Alternatives B and C, the emphasis for restoration would focus on dry forests with medium to large sized trees, and with high tree densities. In dense, old, and mature Douglas-fir and ponderosa pine forests, stand density would be moved toward stands that consist of fewer trees per acre with a larger average diameter. A range of 5,600 to 12,200 acres per decade of dry forest habitat type with medium to large sized trees and high tree densities would be treated under Alternative D (subset of objective for total acreage treatments). Dry forest stands that are in an ecologically "healthy" condition which can sustain the growth of the larger trees while successfully reproducing and maintaining the juvenile growth of the younger trees would also be maintained under Alternative D. Maintenance treatments in forests would promote the large, overstory trees and natural regeneration that would provide diverse age and size classes. Maintenance of existing dry forest habitat types would be considered "moderate priority" with 1,000 to 3,500 acres per decade proposed for treatment (subset of objective for total acreage treatments).

Approximately 500 to 1,500 acres per decade of small diameter thinning of seedling/sapling and pole size dry forest would also occur with Alternative D (subset of objective for total acreage treatments). A small amount of pure limber pine habitat would also be treated under Alternative D, approximately 200 to 1,000 acres per decade. The majority of ponderosa pine treatments would occur in the Upper Missouri Watershed.

Cool and Moist Forest Types

Cool and moist forest types would be managed the same as in Alternative B. Restoration of these habitat types may also be done to meet desired future conditions for cool and moist forest ecosystems and wildlife habitat including the creation of forage for lynx in lodgepole pine forests.

Treatment of cool and moist forest types would be considered a moderate priority under Alternative D. The priority watershed for implementation of treatments in cool and moist forest is the Big Hole.

The objective for total amount of cool and moist forest treatments per decade under Alternative D would be 1,000 to 5,050 acres. These acres are displayed by major watershed in **Table 2-23**.Approximately 800 to 4,450 acres per decade of stands with medium to large sized trees and with high tree densities in cool and moist forest types would be treated in this alternative. Small diameter thinning would also occur on approximately 200 to 600 acres per decade in seedling/sapling and pole size cool and moist Douglas-fir and lodgepole pine forests. These acreages are subsets of the objective for total acreage treatments.

Treatments in cool and moist forest types would include the creation of openings to allow for regeneration of lodgepole pine and Douglas-fir. Areas would also be pre-commercial or commercially thinned. Commercial products such as timber and biomass would be produced from these treatments.

Old Forest Structure

Old forest structure would be managed the same as in Alternative B.

Forest and Woodland Products

Based on the expected amount of treatment acres (including the WUI projects), the objective for PSQ would be 36,000 to 107,000 CCF or 10 to 30 MMBF per decade under Alternative D.

Some new permanent roads may be built for long-term management of areas where multiple entries would be necessary to meet objectives. New road construction, however, would be kept to a minimum. Some new permanent roads could be "open" to the public if travel plan objectives for the area are met. Temporary road construction would be kept to a minimum.

The small sale program would provide the estimated quantities of permits and products shown in **Table 2-23.** Access for small sales would be developed as needed. Alternative D would also promote and encourage biomass utilization and encourage and promote the use of woody material in local businesses such as landscaping and furniture building.

Personal use firewood permits valid for wood collection from both BLM and Forest Service lands in Western Montana would continue to be offered by BLM in cooperation with the Forest Service.

Standing dead and down wood would be allowed to be taken as firewood. BLM could designate specific areas for firewood cutting `of live trees to meet other resource objectives. No dead trees greater than 24 inches DBH would be allowed to be cut for firewood.

Firewood would not be allowed to be cut within 100 feet of live (yearlong flow) streams or within 50 feet of intermittent streams or within the SMZ, whichever width is greatest.

Timber Salvage

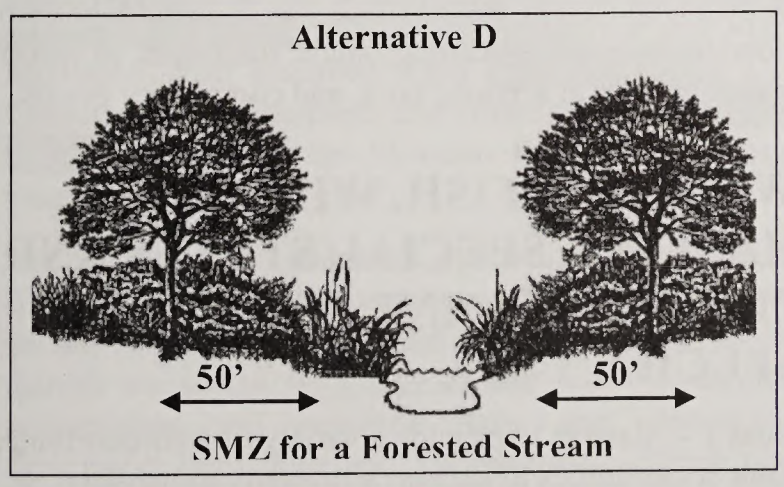
Where contiguous acres of dead and dying forest exceed 1,000 acres, 30 percent of the area would be maintained as retention. Harvest treatments within the remaining project area may include: 1) creation of forest openings, 2) selective thinning between openings, and 3) no retention requirements within harvest treatment area.

Bark beetle suppression treatments, which may target large tree removal, would be permitted to contain outbreaks and to reduce the risk to other forest stands in the vicinity.

Riparian

The emphasis in Alternative D would be to actively restore riparian habitats. When possible, the restoration and enhancement of aspen, cottonwood, willows, or other riparian dominant species along with channel improvement would also be incorporated into other projects in the vicinity of the riparian habitats.

Under Alternative D, riparian protection would be provided by Streamside Management Zones.



The objective for total amount of riparian vegetation habitat proposed for mechanical and/or prescribed burning treatments per decade under Alternative D would be 300 to 1,700 acres (this includes vegetative treatments and not changes in grazing practices). These acres are displayed by major watershed in **Table 2-23**.

Forest and fuels management activities including commercial timber harvest would be allowed in SMZs to meet riparian restoration or maintenance objectives and only if adequate woody material remains in the riparian area.

Where the primary project objective is aspen restoration, treated aspen stands would be fenced from livestock and wildlife grazing and browsing. Fencing could consist of native, on-site materials to create barriers to livestock and wildlife. All fences (with the exception of barriers created from native, on-site material) would be maintained and removed within 10 years or when the aspen is fully re-established or recovered.

Livestock Grazing

Livestock grazing would be allowed on about 278,000 acres of public land. Under Alternative D, approximately 29,000 acres of public land would be unavailable for grazing permits or leases **(Table 2-23**). The amount of forage available on these lands would be 25,677 AUMs active use.

After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would be available to qualified applicants per the grazing regulations. These allotments would be administered like all other existing allotments.

The existing Indian Creek allotment would be expanded up to an additional 5,566 acres and 700 AUMS by the Iron Mask Acquisition. The Indian Creek allotment would be available to qualified applicants per the grazing regulations. This allotment would be administered like all other existing allotments. The Centennial Gulch (Ward Ranch) allotment would be available to qualified applicants per the grazing regulations.

Allotments where grazing preference is relinquished would remain available for livestock grazing leases or permits.

Areas identified for prescribed burning would be rested from livestock grazing prior to treatment, if necessary, to produce fine fuels to carry the burn. Treatment areas would be rested at a minimum of two full years following treatment to promote recovery of vegetation.

Grazing practices would be adjusted to protect or enhance fish and wildlife habitat when livestock grazing is a contributing factor to not meeting Land Health Standards.

Currently existing exclosures would be maintained free from livestock grazing as long as needed to meet objectives. Exclosures would be checked and maintained

every five years. Maintenance would be accomplished as per the terms and conditions of existing cooperative agreements.

Existing livestock exclosures along streams, wetlands, and riparian areas would be maintained as long as needed to meet management objectives. Exclosures would be checked and maintained per the terms and conditions of existing cooperative agreements or every five years.

As with Alternative A, the existing Instruction Memorandum 98-140 (USDI-BLM 1998b) would be followed to protect wild sheep. As with Alternative B, goats and sheep could be used for weed control on winter ranges when wild sheep are absent. To minimize contact with bighorn sheep, domestic sheep, and goats used for weed control would only be allowed to graze for up to 1 month near occupied bighorn sheep habitat and there would be a minimum buffer of 2 miles between domestic and wild sheep. Bedding grounds would be a minimum of 4 miles from known bighorn sheep habitat. The use of domestic sheep and goats would only be allowed from May 1 to July 31 unless coordinated with MFWP. A herder would be required to be on site at all times and be able to communicate with the BLM, the herd owner and MFWP. If bighorn sheep and domestic sheep and goats come into contact, the herder would be required to contact the BLM and MFWP immediately.

Wildland Fire Management

BFO administered lands would be broken into ten FMUs. The FMUs would have B, C, and D designations applied. Approximately 42,000 acres would be designated in category B; 82,000 acres in category C; and 183,000 acres in category D (**Table 2-5** and **Map 5**).

Table 2-5
Alternative D Fire Polygons by Watershed

FMU	Category[1]	BLM Acres[2]
Big Hole	C	60,000
Blackfoot	B	1,000
Central Missouri	B	37,000
Gallatin	B	2,000
Jefferson	D	82,000
Missouri	D	101,000
NW Missouri	C	14,000
Upper Clark Fork	B	1,000
Wise River	B	1,000
Yellowstone	C	8,000

[1]Category and associated treatments only apply to BLM land within each zone.

[2]Acres are approximate and rounded to nearest 1000.

The FMUs follow watershed boundaries with two exceptions: the Missouri watershed is broken into three FMUs (Missouri, Central Missouri, and NW Missouri) and the Big Hole watershed would be broken into two FMUs (Big Hole and Wise River) due to the urban interface areas surrounding Helena and Wise River.

Fire management activities would correspond to the FMU designations. There would be no restriction on timing of vegetation treatments; and planned management-ignited prescribed fire units size would be determined by an interdisciplinary team through site-specific NEPA analysis. In grassland/ shrubland habitats, BLM would plan for prescribed burns that do not consume above-ground vegetation on more than 90 percent (on average) of each unit by surface area.

Delivery of chemical retardant, foam or additives to live streams would be avoided.

Noxious Weed Management

Under Alternative D, more aggressive weed management would be needed in response to the increased use and ground disturbance in the Decision Area. Prevention and control of weed infestations in special designation areas, Weed Management Areas (areas with agreements between landowners to cooperatively manage weeds), and areas currently under a multi-year treatment plan would be considered a moderate priority.

The objective under Alternative D would be to treat an estimated 25,000 to 61,000 acres of weeds per decade, not including biocontrol measures such as insect releases, grazing, or use of pathogens.

Aerial spraying of herbicides or pesticides would not occur when eye-level winds are greater than 6 miles per hour or within 100 feet of streams or wetlands. Aerial spraying would be conducted in a way that minimizes the effects on native forbs, grasses, and shrubs.

To prevent special status plants from being sprayed with herbicides, BLM, county, and contractor personnel participating in weed treatment activities would be provided with training to identify special status plants and maps of special status plant populations associated with weed treatment areas.

Outreach/education on noxious weeds would be provided to the public at campgrounds, trailheads, to specific user groups, at schools, fairs, and community events.

WILDLIFE, FISH, WILDLIFE HABITAT, SPECIAL STATUS AND PRIORITY PLANT AND ANIMAL SPECIES

Goal 1 – Manage to provide a variety of well-distributed plant communities to support a diversity of habitats.

Goal 2 – Conserve, enhance, restore, or minimize impacts to areas of important wildlife habitat such as rare or limited seasonal habitats, corridors, blocks of intact functional habitat across the landscape, areas of low road-density, foraging areas, and riparian areas.

Goal 3 – Conserve, enhance, or restore special habitat features or minimize impacts to special habitat features including, but not limited to caves, cliffs, riparian areas, wetlands, snags, and down woody material.

Goal 4 – Management prescriptions or authorizations conserve, enhance, restore, minimize impacts, or contribute to the recovery of threatened, endangered, or candidate plant or animal species.

Goal 5 – Management prescriptions or authorizations conserve or enhance habitat or minimize negative effects to habitat of BLM sensitive plant and animal species to prevent the federal listing of these species.

Goal 6 – Special-status species and habitats are conserved through collaboration and cooperation.

Goal 7 – Protect, maintain, restore, and rehabilitate sagebrush habitat in occupied or historic sage grouse habitat (as mapped by MFWP).

Management Common to All Alternatives

All alternatives would emphasize actions that would promote conservation of special status wildlife species and the ecosystems on which they depend. All alternatives would emphasize maintaining and supporting healthy, productive, and diverse populations and communities of native plants and animals (including big game species such as deer, elk, and bighorn sheep) appropriate to soil, climate, and landform.

One key objective under all alternatives would be for BLM to conserve federally listed and recently de-listed species. BLM would implement recovery activities for these species by complying with and adopting current and future recovery plans (such as Grizzly Bear Recovery Plan (USFWS 1993), Ute's Ladies' Tresses Recovery Plan, Grizzly Bear Management Plan for Southwest Montana (MFWP 2002a), Interim Bull Trout Habitat Conservation Plan Strategy, Montana Gray Wolf Conservation and Management Plan (2004), Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987), Lynx Conservation Assessment and Strategy (see **Appendix G – Wildlife**), and the Montana Bald Eagle Management Plan (MBEWG 1994).

Another objective under all alternatives would be for BLM to conserve sensitive species. BLM would manage habitat for sensitive terrestrial and aquatic species in a manner consistent with current and future restoration, conservation and recovery plans, and conservation agreements (westslope and Yellowstone cutthroat trout, Arctic grayling and prairie dog). Management activities would be designed and implemented consistent with adopted conservation strategies, including Montana's Comprehensive Fish and Wildlife Conservation Strategy (MFWP 2005b), and current, accepted science for special status and priority species.

Fish and wildlife would continue to be evaluated on a case-by-case basis as part of project level planning. Such evaluation would consider the significance of the proposed project and the effects to fish and wildlife habitat. Measures to reduce impacts would be attached as appropriate to assure compatibility of projects with management objectives for fish and wildlife habitat.

Habitat improvement projects would be implemented where necessary to restore wildlife habitat and/or to improve unsatisfactory or declining wildlife habitat.

Important blocks of hiding, security, and thermal cover for big game would be considered during project planning.

For all alternatives, all new fences would be built to standard BLM wildlife specifications (USDI – BLM 1989b. Bureau of Land Management Fencing Handbook, H-1741-1) to allow wildlife passage with the exception of fences built specifically to keep native ungulates out of an area unless site specific analysis indicates other specifications are necessary.

Consistent with the requirements of the Endangered Species Act (1973) and BLM policy, all alternatives would ensure that actions are consistent with the conservation needs of special status species. The BLM would seek opportunities to conserve and improve special status species habitats and habitats for native plants and wildlife in project level planning and in other BLM authorized, funded, or approved activities (BLM Manual 6840 – Special Status Species Management, Endangered Species Act).

BLM would determine the distribution, abundance, and management needs of special-status plant and animal species and species of local interest occurring on BLM administered lands and evaluate needed management for the conservation of these species.

As per Executive Order 13443, the BLM would facilitate the expansion of hunting opportunities and management of game species and their habitats.

BLM would cooperate and collaborate with federal, tribal, and state wildlife management agencies as well as private landowners to improve habitat for wildlife (including game species as per Executive Order 13443) and special status plants.

Conservation actions, inventories, and monitoring for special status wildlife and aquatic species would be prioritized based on habitats at risk and rarity.

Timing restrictions may be used in special status species habitat. Human activities that disrupt special status species habitats during their seasons of use, particularly

during the breeding and winter seasons would be avoided or minimized.

Sage grouse management activities would be designed and implemented to be consistent with adopted conservation strategies such as The National and Montana Management Plan and Conservation Strategies for Sage Grouse in Montana (MSGWG 2005) and current, accepted science.

Vegetation altering activities could occur in sage grouse habitat where it does not result in long-term loss of habitats or contribute to the need to list. Sufficient sagebrush densities and cover would be retained in sage grouse habitat.

BLM would coordinate the fisheries program with other programs to improve aquatic habitat.

Populations of special-status plants would be monitored to assess their condition and trend.

BLM would maintain and improve critical or essential habitat to prevent deterioration and provide recovery for federally listed plant species.

Field inspections would be conducted to identify special-status plant species prior to authorized surface disturbing activities. Waivers for on-the-ground inventory may be granted in areas determined to have low potential based on previous research.

Alternative A – No Action

MFWP and the USFWS would be consulted prior to implementing projects that may affect habitat for threatened and endangered species.

Management actions would be consistent with the guidelines that were developed through the Interagency Wildlife Monitoring Program for mineral exploration and development.

All management activities, including timber harvest and prescribed burning, in the Elkhorn Wildlife Management Area would be designed to maintain or improve wildlife habitat. New road construction would be kept to a minimum and all new roads would be closed to the public.

Guidelines from the Montana Cooperative Elk-Logging Study (Lyons *et al.* 1985) would continue to be used in formulation of forest activity plans affecting occupied grizzly bear and elk habitat including: managing public vehicle access to maintain effectiveness of security cover and key seasonal habitat for deer and elk; maintaining adequate untreated peripheral zones around important moist sites; maintaining adequate thermal and security cover in deer and elk habitat, particularly within timber stands adjacent to primary winter foraging areas; ensuring slash depth in clear cuts does not exceed 1.5 feet; and generally discouraging thinning immediately adjacent to clear cuts.

The MFWP would be consulted in advance of timber harvest activities involving: construction of new access roads into unroaded elk summer and fall range; critical, crucial, or essential wildlife habitat; and sales of over 250 MBF.

Wildlife reintroduction proposals would be evaluated and recommendations would be made to the MFWP.

Animal control projects would be coordinated with the USFWS and Wildlife Services, and in the case of aerial gunning with the Montana Department of Livestock.

Seasonal timing restrictions on projects that cause disturbance would continue to be applied where they are needed to minimize the impacts of human activities on important seasonal wildlife habitat. The major types of seasonal wildlife habitat and the time periods which restrictions may be needed are: elk, mule deer, moose and bighorn sheep winter and spring range (12/1 to 4/30), elk, mule deer and bighorn sheep calving range/habitat (5/1 to 6/30), mountain goat winter range (12/1-4/30) and mountain goat spring range (5/1-6/30), grizzly bear spring and summer range (4/1 to 9/1), and grizzly bear denning habitat (10/1 to 4/30).

Management Common to Action Alternatives (B, C, and D)

All federally listed and BLM sensitive species and their habitats would be considered priority species and habitats. Additional priority wildlife species would be based on public interest, density, diversity or population size including big game (such as elk, bighorn sheep, deer, and antelope) and migratory birds listed by USFWS and Level 1 and Level 2 species listed under the Montana Bird Conservation Plan (Partners in Flight 2000). Tier I and Tier II habitat and species from Montana's Comprehensive Fish and Wildlife Conservation Strategy (MFWP 2005b) would also be considered priority species and habitats. Priority habitats would include habitat for all special status species as well as riparian areas, dry savannah forest, special habitats including caves, cliffs, and snags and down woody material, sagebrush, bitterbrush communities and mountain mahogany communities.

Management techniques, including but not limited to prescribed and managed wildland fire, prescriptive livestock grazing, planting, exclusion to intense disturbance, timber harvest and other mechanical methods would be used to restore, maintain or improve the desired ecological conditions of vegetation communities for the purpose of improving forage, nesting, breeding, and security habitat, hiding cover and travel corridors for a wide diversity of terrestrial and aquatic species.

The BLM would emphasize providing habitat of sufficient quantity and quality, including connectivity and wildlife movement corridors, habitat complexity, forest openings, edges, and ecotones, to enhance biological diversity and provide quality, sustainable habitat for

native wildlife species. BLM would maintain suitable habitat conditions and minimize fragmentation in linkage corridors among habitats and priority species. BLM land would be managed to consider the relationship between large special status species populations and smaller isolated populations whenever possible. The intent would be to maintain the function and diversity of all habitats in large areas (patches) across the landscape and minimize long-term human disturbance to wildlife to provide habitat for wildlife movement, dispersal, and home ranges. In the context of wildlife habitat fragmentation, the size of the "patch" would be related to the size of the BLM parcel(s) and adjacent federal or state lands.

BLM would coordinate with MFWP to determine whether habitat and other conditions exist that would allow successful reintroduction of locally or regionally absent species, such as westslope cutthroat trout, sage grouse, beaver, bighorn sheep, mountain goat, and prairie dogs.

To the extent possible, BLM would: maintain large patches of high quality sagebrush in occupied or historic sage grouse habitat (as mapped by MFWP); maintain connections between sagebrush habitats and enlarge the size of sagebrush patches in occupied or historic sage grouse habitat.

During project level planning, key habitat components that would be emphasized would include: winter range, seasonal migration corridors, breeding sites, roosting sites, and foraging habitats adjacent to raptor nest sites.

Disturbance of crucial wildlife breeding areas such as known den sites or big game breeding or winter range would be minimized. Actions that cause disturbance would be minimized to reduce negative effects to special status and priority species during seasonally sensitive periods such as; the breeding, nesting, winter, and roosting seasons.

Seasonal timing restrictions on projects that cause disturbance would be applied where needed to minimize the impacts of human activities on important seasonal wildlife habitat. The major types of seasonal wildlife habitat and the time periods which restrictions may be needed are: big game winter and spring range (12/1 to 5/30), big game calving range/habitat (5/1 to 6/30), mountain goat nursery areas (5/1 to 7/15), mountain goat breeding areas (11/1 to 12/31), mountain goat winter range (10/15 to 5/15), grizzly bear spring and summer range (4/1 to 9/1), and grizzly bear denning habitat (10/1 to 4/30). These dates would be revised when new data becomes available.

One objective under all action alternatives would be to maintain functional blocks of security habitat for big game species across the landscape. Where minimum-size blocks of security habitat (250 acres), as defined by Hillis et al. (1991), are located, they would be retained in a suitable condition during project planning and implementation. Protection of larger blocks of security habitat would also be addressed during project or watershed level planning. Where security habitat is limited or fragmented across the landscape, the BLM would emphasize improving habitat through vegetation treatments and road closures (including seasonal closures) to increase security habitat for big game species.

BLM would close rock climbing on spires with active raptor nests and educate the public about the importance of avoiding such locations.

Within appropriate habitats, snags and down woody material would be managed to be well-distributed across the landscape in sufficient quantity and quality to support species dependent upon these habitats.

At the project level, dead and down woody material would be retained in amounts that are within the range of natural variability for the plant community, to the extent compatible with reforestation objectives, fire hazard reduction standards, and public safety.

In grasslands and shrublands undergoing vegetation treatments such as the removal of conifer encroachment through mechanical thinning or prescribed burning, all trees and snags with characteristics of old forest structure would be left standing to the extent practicable.

All action alternatives would emphasize protecting and restoring special habitat components or features that contribute to the productivity of bat species. These features include, but are not limited to, caves, cliffs, riparian areas and wetlands and snags and down wood.

Caves and abandoned mines would be surveyed and assessed for bat use of features. BLM would determine the need for closures or seasonal closures for activities affecting caves and abandoned mines. Hibernacula closure dates would be approximately October 15 to May 1 and maternity closure dates would be approximately April 15 to September 30.

Bat gates or other suitable measures would be used to protect bat habitat when bat use of caves or abandoned mines is determined. Public health and safety would take precedence over protection of bat habitat if hazardous mine openings cannot be remediated with installation of bat gates. Efforts would be made to safely remove resident bats prior to closure.

BLM would comply with the standards and guidelines in the Canada Lynx Conservation Assessment and Strategy (**Appendix G – Wildlife**).

BLM would develop and implement human food storage regulations and guidelines in grizzly bear distribution zones in coordination with MFWP and other agencies.

All action alternatives would emphasize maintaining diverse, healthy, productive, well-distributed aquatic habitats and communities to increase populations of native fish and other aquatic species.

The BLM would emphasize maintaining and/or restoring the structure, composition, and function of aquatic ecosystems to support a diversity of aquatic plant and animal species and emphasize hydrologic connectivity within watersheds to maintain and/or restore habitat and connectivity needs for populations of aquatic dependent species.

The BLM would restore and/or maintain riparian structure, composition, and processes, including physical integrity of riparian ecosystems, amount and distribution of woody debris to sustain physical and biological complexity, adequate summer and winter thermal regulation, water quality and hydrologic processes, distribution and diversity of riparian vegetative communities and source habitats for riparian dependent species. BLM would opportunistically enhance or restore habitat for westslope and Yellowstone cutthroat trout and Arctic grayling.

The distribution and abundance of native fishes and other aquatic species would be increased through the maintenance or restoration of habitat.

In select areas identified for native fish restoration, BLM would collaborate with MFWP to remove non-native fish species that out-compete or hybridize with native cutthroat trout.

Transportation system effects on fisheries resources would be reduced. To the extent possible, roads would be located, designed and maintained to reduce sedimentation, identify and remove unnatural barriers, eliminate fish passage barriers (when desired), and restore or maintain riparian vegetation.

Watershed restoration projects would be designed and implemented in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to meeting riparian standards.

Alternative B – Preferred Alternative

Alternative B would also emphasize protection and restoration of habitats for native wildlife, plants, and special status species. There would be a focus on biological diversity by restoring vegetation cover types and structural stages that have declined substantially including dry, open forest habitats with low tree densities, meadow habitats, shrub and hardwood dominated riparian systems, as well as open grasslands and shrublands with low tree densities. Using vegetative treatments described in the previous sections of this chapter, this alternative would restore vegetation to become more consistent with natural disturbance regimes and with the landform, climate, and biological and physical characteristics of the ecosystem. Management would emphasize moderate to large vegetation patch sizes and distribution to be more consistent with natural disturbance regimes and ecosystem characteristics.

At the Field Office scale, the intent would be to maintain, protect, and restore habitat for priority wildlife species including but not limited to: deer, elk, pronghorn, bighorn sheep, and sage grouse.

Alternative B would maintain, improve, and restore habitats to support healthy, productive, and diverse wildlife populations and communities of native plants and animals. Where consistent with habitat capabilities and national conservation direction, Alternative B would contribute to meeting state wildlife species management objectives for deer, elk, pronghorn, bighorn sheep, and special status species.

One objective under Alternative B would be to minimize disturbance to big game and grizzly bears. There would be no net increase in permanent roads built in areas where open road densities are 1 mi/mi^2 or less in big game winter and calving ranges, and within the current distribution of grizzly bear unless not possible due to right-of-ways, leases, or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition. This alternative would also manage to reduce open road densities in big game winter and calving ranges, and within the current distribution of grizzly bear where they currently exceed 1 mi/mi^2.

At the Field Office scale, BLM would enhance and improve big game winter range by protecting and restoring mountain mahogany stands where conifers have become established. Detrimental effects on mountain mahogany stands would be avoided with projects in big game winter range whenever possible. When detrimental effects are unavoidable, loss of mountain mahogany would be minimized. BLM would also proactively restore the distribution and vigor of bitterbrush stands through vegetative treatments designed to reduce competing plants, create a variety of age classes, and create conditions conducive to bitterbrush natural regeneration.

Alternative B would include an objective to manage for adequate numbers, species and sizes of snags and levels of downed wood to contribute to the needs of wildlife, invertebrates, fungi, bryophytes, saprophytes, lichens, other organisms, long-term soil productivity, nutrient cycling, carbon cycles and other ecosystem processes. To determine the "range of natural conditions" for snag densities, BLM would follow the "Northern Region Snag Management Protocol" (USDA-FS 2000a) until more current or site specific information becomes available. Prescribed fire, mechanical treatments, inoculation, or other appropriate methods would be used to create snags and down woody material, where deficient, in appropriate vegetation types across the landscape.

Management for wildlife values associated with large amounts of down wood and snags would be emphasized less in WUI areas to allow for fuels reduction projects that would reduce the potential for extreme wildland fire. Fences identified as barriers to wildlife movement

would be considered for removal or reconstruction to follow BLM fence specifications for wildlife.

Noise disturbance and management activities would be avoided or minimized within 0.5 miles of raptor nests during the nesting and brood rearing period.

Unoccupied raptor nests (on cliffs, rocky outcrops or in trees) would be protected from removal or destruction for 5 years, or the period a known preferred prey species fluctuates from population highs to lows. Nests would not have to be retained if physically damaged past the point of repair by raptors. In forested habitat types, a 0.25 mile buffer of suitable habitat around unoccupied nests would be maintained for 5 years.

Bald eagle nesting and roosting habitats would be actively protected from loss due to fire, insect, or disease by reducing vegetation competition and encroachment in these habitats.

Clearing of vegetation, except noxious weeds, would not be allowed within 250 feet of the entrance of caves and abandoned mines with populations of bats except when needed for public safety. Vegetation could be removed if necessary when installing bat gates, or when it becomes an obstruction to bat movement.

For habitat enhancement, fire rehabilitation and other restoration projects, a variety of techniques would be considered to protect plantings and seedlings from wildlife and domestic grazing including rest, fencing, netting, and wildlife repellants.

Alternative B would manage for diverse and well-distributed aquatic habitats to increase and maintain habitat for native and locally important fish.

Genetically pure and slightly hybridized (less than 20 percent hybridization) westslope cutthroat trout populations would be managed by maintaining or restoring high-quality habitats and by expanding populations. Under Alternative B, the BLM would work with MFWP to remove brook trout and other non-native aquatic species that out-compete or breed with westslope cutthroat trout through the use of electroshocking or other physical or chemical means.

To prevent spread of non-native, invasive aquatic species, BLM would post educational signage at all BLM boat ramps on waterborne invasive species.

Alternative C

Alternative C would actively restore fewer acres of habitat through vegetative treatments for native wildlife and special status species than Alternatives B or D. Management would emphasize protecting small to large vegetation patch sizes.

Habitat for locally important wildlife species such as deer, elk, pronghorn, bighorn sheep, and sage grouse would be maintained or protected. Fewer acres of habitat for these species would be proactively restored with Alternative C then the other action alternatives. Alternative C would emphasize protecting habitats to support healthy productive and diverse wildlife populations, and, where consistent with habitat capabilities and national conservation direction, contribute to meeting state wildlife species management objectives for deer, elk, pronghorn and bighorn sheep and other priority species.

Alternative C would restore fewer vegetation communities to become more consistent with natural disturbance regimes and with the landform, climate, and biological and physical characteristics of the ecosystem.

Like Alternative B, Alternative C would include the objective to minimize disturbance to big game and grizzly bears. There would be no net increase in permanent roads built in areas where open road densities are 1.5 mi/mi^2 or less in big game winter and calving ranges and within the current distribution of grizzly bear unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition. This alternative would also manage to reduce open road densities in big game winter and calving ranges and within the current distribution of grizzly bear where they currently exceed 0.5 mi/mi^2.

Natural processes and continued fire suppression would determine the structure and composition of mountain mahogany where conifers have become established. Mountain mahogany stands would be restored or enhanced opportunistically through other higher priority projects. Bitterbrush would be protected or restored opportunistically through other projects.

Like Alternative B, Alternative C would include the objective of managing for adequate numbers, species, and sizes of snags and levels of down wood. To determine the "range of natural conditions" for snag densities, BLM would follow the "Northern Region Snag Management Protocol", January 2000, USDA Forest Service Northern Region, until more current or site specific information becomes available. Snags and down woody material would not be proactively created where deficient on the landscape but would be created opportunistically through other project work such as fuels reduction or ecosystem restoration. The focus would be snag and down wood protection instead of actively creating these features.

Fences identified as barriers to wildlife movement would be removed or reconstructed to follow BLM fence specifications for wildlife. Noise disturbance and management activities would be avoided or minimized within 1 mile of raptor nests during the nesting and brood rearing period.

Unoccupied raptor nests (on cliffs, rocky outcrops or in trees) would be protected from removal or destruction for 7 years, or the period a known preferred prey species fluctuates from population highs to lows. Nests would not have to be retained if physically damaged past the

point of repair by raptors. In forested habitat types, a 0.5 mile buffer of suitable habitat would be maintained around unoccupied nests for 7 years.

As with Alternative B, bald eagle nesting and roosting habitats would be actively protected from loss due to fire, insect or disease by reducing vegetation competition and encroachment in these habitats. As with Alternative B, clearing of vegetation, except noxious weeds, would not be allowed within 250 feet of the entrance of caves and abandoned mines with populations of bats except when needed for public safety. Vegetation could be removed when installing bat gates or when it becomes an obstruction to bat movement.

For habitat enhancement, fire rehabilitation and other restoration projects, plantings, and seedlings would be protected from the effects of wildlife and domestic grazing using methods such as rest, fencing, netting, and wildlife repellants.

All westslope cutthroat trout populations, regardless of hybridization, would be protected by maintaining high-quality habitats and by expanding populations.

BLM would work with MFWP to remove brook trout and other non-native aquatic species that out-compete or breed with westslope cutthroat trout through the use of electroshocking or other physical or chemical means.

To prevent spread of non-native, invasive aquatic species, BLM would post educational signage at all boat ramps on waterborne invasive species

Alternative D

Alternative D would protect and restore habitat for native wildlife and special status species. Alternative D would restore more vegetative acres than Alternatives A, B, or C. Management would emphasize vegetation patch size and distribution to be more consistent with natural disturbance regimes and ecosystem characteristics.

Alternative D would have a focus on biological diversity by restoring vegetation cover types and structural stages that have declined substantially from the historical to the current time period. Vegetation would be restored to become more consistent with natural disturbance regimes and with the landform, climate, and biological and physical characteristics of the ecosystem. Habitats would be maintained or improved to support healthy, productive, and diverse populations and communities of native plants and animals (including species of local importance). Where consistent with habitat capabilities and national conservation direction, Alternative D would contribute to meeting state wildlife species management objectives for deer, elk, pronghorn, bighorn sheep, and other priority species.

Habitat for locally important wildlife species such as deer, elk, pronghorn, bighorn sheep, and sage grouse would be maintained, protected, and restored.

As with Alternative B, Alternative D would include the objective of minimizing disturbance to grizzly bears by allowing no net increase in permanent open roads in areas where open road densities are 1 mi/mi^2 or less within the current distribution of grizzly bear unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition. This alternative would also manage to reduce open road densities within the distribution of grizzly bear that currently exceed 1 mi/mi^2.

Alternative D would also include the objective to minimize disturbance to big game. No net increase in permanent open roads would be allowed in areas where open road densities are 0.5 mi/mi^2 or less in big game winter and calving ranges unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition. Open road densities would be reduced in big game winter and calving ranges where they currently exceed 1.5 mi/mi^2. BLM would enhance and improve big game winter range by protecting and restoring mountain mahogany stands where conifers have become established. BLM would proactively restore the distribution and vigor of bitterbrush stands through vegetative treatments designed to reduce competing plants, to create a variety of age classes, and to create conditions conducive to bitterbrush natural regeneration.

In concert with the timber management program, a snag management program would be implemented to enhance habitat for cavity nesting birds.

Fences identified as barriers to wildlife movement would be considered for removal or reconstruction on a case by case basis to follow BLM fence specifications for wildlife. Noise disturbance and management activities would be avoided or minimized within 0.25 mile of raptor nests during the nesting and brood rearing period.

Unoccupied raptor nests (on cliffs, rocky outcrops or in trees) would be protected from removal or destruction for 3 years, or the period a known preferred prey species fluctuates from population highs to lows. Nests would not have to be retained if physically damaged past the point of repair by raptors. In forested habitat types, a 0.25 mile buffer of suitable habitat would be maintained around unoccupied nests for three years.

Genetically pure and slightly hybridized (less than 10 percent hybridization) westslope cutthroat trout populations would be protected by maintaining or restoring high-quality habitats and by expanding populations.

To prevent spread of non-native, invasive aquatic species, BLM would install boat wash stations at all major boating access sites.

TRAVEL MANAGEMENT AND ACCESS

Travel management and access is addressed at two levels. Proposed management is described at the Field Office level as part of the RMP decisions to be made. In addition, there are five Travel Planning Areas (TPAs) for which site-specific management by individual travel routes is proposed by alternative. Site-specific travel plan implementation decisions for each of these five areas will be made separately from the RMP level decisions.

The vision for travel management is to provide for a range of quality motorized and non-motorized opportunities.

Goal – Provide a balanced approach to travel management that provides a sustained flow of local economic benefits, minimizes user conflicts, safety concerns, and resource impacts while taking into consideration the unique attributes and values of the various Travel Planning Areas.

FIELD OFFICE LEVEL

Management Common to All Alternatives

Regulations at 43CFR8340 through 43CFR8342.3 would be applied in identifying area designations Field Office-wide and in identifying route-specific management where activity plan level decisions would be made for specific travel routes.

Travel management would be conducted in a manner that would meet, or move toward meeting, Land Health Standards.

Areas within the Decision Area would be categorized as "Open", "Closed", and "Limited." An "Open" area is where all types of vehicle use are permitted at all times, anywhere in the area. A "Closed" designation means all motorized use is prohibited.

In accordance with the 2003 Statewide OHV ROD (USDI-BLM 2003c), under the "Limited" designation, all cross-country motorized, wheeled travel (including big game retrieval) is prohibited unless otherwise managed. In the absence of other existing travel plan direction, all motorized wheeled travel is restricted to existing roads and trails. However, the ROD provides several exceptions to this rule (refer to ROD, pages 4-5). Examples include:

1. Any military, fire, search and rescue, or law enforcement vehicle for emergency operations;
2. Official BLM administrative business (prescribed fire, noxious weed control, range management, etc.);
3. Other government agency business (surveying, animal damage control, etc.);
4. Administration of a federal lease or permit (e.g., livestock permittee maintaining fence, delivering salt, etc.); and,
5. For dispersed camping within 300 feet of an existing open road. Site selection must be completed by non-motorized means, and accessed by the most direct route causing the least damage.

Comprehensive inventories of all existing routes would be used.

Travel Planning Areas that has existing travel plans are:

1. Elkhorn Mountains – "limited" area designation – (with the exception of an approximately 631.88 acre "open" OHV use area near Radersburg);
2. Clancy-Unionville – "limited" area designation;
3. Whitetail-Pipestone – "limited" area designation – (with the exception of an approximately 5 acre "open" motorized motorcycle hill climb area); and,
4. Sleeping Giant – "limited" area designation.

Additional travel planning has been completed for several smaller "sub-planning" areas; Confederate Gulch, Sawlog Creek, the Great Divide Ski area, and Nez Perce Ridge Road. Several "temporary area closures" are in effect as well, pending future travel planning. The temporary area closures include the North Hills, Sawmill Gulch, Ward Ranch, the McMasters, Spokane Hills, and Iron Mask. Each of these areas is being brought forward under the Limited area designation.

No site specific route management changes have been proposed for the Confederate Gulch, Great Divide Ski Area, Nez Perce Road, and Sawmill Gulch areas. However site specific route management changes have been proposed for the Sawlog Creek, North Hills, Ward Ranch, McMasters, and Spokane Hills. (See site specific activity travel plan alternatives).

In accordance with the 2003 Statewide OHV ROD and plan amendment, nine additional areas, all with "limited" area designations have been identified that need site-specific travel planning. The nine proposed areas are:

1. Helena (focus area – Scratchgravel Hills). High Priority;
2. East Helena (focus area – North Hills). High Priority;
3. Lewis and Clark Country Northwest (focus area – Marysville). High Priority;
4. Boulder/Jefferson City. High Priority;
5. Upper Big Hole River. High Priority;
6. Missouri River Foothills. Moderate Priority;

7. Jefferson County Southeast. Moderate Priority;
8. Broadwater County South. Moderate Priority; and,
9. Park/Gallatin. Moderate Priority

The five high priority areas are being addressed at the activity plan level concurrently with this RMP revision. Travel planning for high priority areas is supposed to be initiated within two years of the OHV ROD, and moderate priority areas within five years of the OHV ROD. (Refer to the OHV ROD for complete details).

Existing routes would be evaluated for adequacy, relevance, and impacts to resources and resource uses. A range of travel management opportunities that provide a balanced approach among motorized, mechanized, and non-motorized use would be developed.

BLM would use a range of route management options, including Open Yearlong, Open with Restrictions, Closed Yearlong, and Decommissioned (**Table 2-6**).

- Open Yearlong - open year-round to public and administrative uses.
- Open with Restrictions - open to public and administrative uses with seasonal and/or vehicle type limitations.
- Closed Yearlong - closed to motorized public access and subject to administrative or permitted uses based on case-specific exceptions (such as for mining claimants with existing claims accessed by existing routes). Routes identified as closed would have a route bed left intact in case they are needed for valid existing rights only, or in the extended future for administrative purposes. Closed routes would be open to non-motorized use.
- Decommissioned - route is closed and rehabilitated to eliminate resource impacts (for example, to eliminate erosion or to restore a riparian area if route is located within a riparian area) and is no longer useable for public or administrative uses.

Opportunities would be sought to disperse or distribute users to help provide a quality recreational experience.

Easement agreements would be pursued as needed to gain agency and public access to BLM lands.

BLM would provide for interagency travel management consistency and route connectivity with adjoining public lands.

Throughout the course of implementing the RMP, site-specific route management decisions may need to be re-evaluated and adjusted by BLM in order to accommodate interagency (Forest Service) connectivity. Proposed changes would be addressed on a case-by-case basis by an interdisciplinary team.

Table 2-6
Field Office Level Route Management Summary

Route Management Category	Alt. A miles	Alt. B miles	Alt. C miles	Alt. D miles
Administrative Access Only	0.8	0.8	0.8	0.8
Open Yearlong	471.8	263.0	244.3	304.8
Open/Restricted as Follows:				
Closed 2/14 to 4/16	0	3.3	0	0
Closed 9/1 to 12/1	0	0	0	3.6
Closed 10/2 to 5/15	0.7	0.7	0.7	0.7
Closed 10/15 to 12/1	34.8	2.1	2.1	1.9
Closed 10/15 to 5/15	12.1	19.1	7.1	13.0
Closed 12/2 to 4/15	2.2	2.2	1.9	0
Closed 12/2 to 5/15	100.8	117.9	109.0	144.3
Closed 12/2 to 6/15	5.0	5.8	5.4	7.6
Closed 12/2 to 7/15	0	0.8	0	0.9
Closed 12/2 to 10/5	1.9	1.9	1.9	1.9
Sub-Total Road Miles Open to Public	629.2	416.8	372.4	478.6
Closed Yearlong	172.0	317.7	375.2	266.2
Decommission	0	52.6	50.1	43.4
Snowmobile Only	0	4.3	3.5	4.6
Trails	14.5	14.5	14.5	14.5
Game Retrieval Only	10.7	18.9	10.7	17.8
Motorcycles Only	6.1	6.1	6.1	6.1
ATV Only	18.8	18.8	18.8	21.0
ATV Only Closed 10/15 to 12/1	0	1.5	0	0
ATV Only Closed 12/2 to 4/1	4.3	4.3	4.3	4.3
Totals	**856.4**	**856.4**	**856.4**	**857.3**

All Designated routes would be mapped and signed as Open, or Open with restrictions (seasonal use restriction, vehicle type use restriction, etc.), instead of taking the opposite approach and signing all closed routes as Closed. In other words, unless a route is specifically signed as Open (or Open with Restrictions), it is closed to motorized use, regardless of whether or not a route Closure sign is in place. This "Closed unless signed as Open" approach places a higher level of burden on the user to be cognizant of where, when, and how they are allowed to travel on public lands. It also eliminates a common act of vandalism, removing route closure signs in order to establish de facto "open" routes. Even so, BLM may still elect to use occasional route Closure signs as needed in areas experiencing compliance problems. Designated routes will be identified and signing using a combination of Portal signs, bulletin boards (posted travel plan maps), and designated route "arrow" symbols.

BLM would continue to participate with the Southwest Montana Interagency Travel Management Committee, maintaining map and sign consistency, and seasonal restrictions.

BLM would continue to partner with the State Trails Program, seeking opportunities to improve existing as well as future trails and facilities.

As roads and trails identified for decommissioning in site-specific travel plans are prioritized, site inventories would be conducted on cultural resources. To provide protection for known cultural resources and those yet to be discovered, sites would be evaluated to determine eligibility for National Register of Historic Places. Ineligible heritage sites would be preserved in place if possible. If adverse effects threaten a site (on roads proposed for closure or open roads), one or more mitigation measures would be employed to lessen or avoid those effects.

These may include:

- Abandon the project.
- Redesign the project to avoid adverse effect with protective measures such as signing, fencing, reroute, or closure of road/trail.
- Data recovery and analysis that could require temporary closure of the area.
- Avoidance by re-routing.

BLM roads within the travel area would continue to be available for a multitude of motorized vehicle travel (2-wheel, 4-wheel, motorcycles, all-terrain vehicles, and snowmobiles), provided safety concerns remain minimal. Should traffic volumes or user conflicts become prevalent and warrant restrictions, then priority would be given to vehicles legally registered to travel on public highways.

In accordance with interagency trail width guidelines, all BLM Designated OHV trails, bridges, and cattleguards are designed to accommodate OHV vehicles 50 inches in width or less. Vehicles wider than 50 inches will be unable to navigate BLM trails; and by default, will be in violation of the off road travel rule.

Variances to travel plan designations may be issued on a case-by-case basis to conduct essential agency administrative actions and site-specific approved uses such as casual use mineral exploration. (Refer to **Appendix A** for details)

Wheeled motorized vehicle travel would be allowed for any military, fire, search and rescue, or law enforcement vehicle for emergency operations.

Temporary routes could be constructed where needed and where other routes are not available under approved travel management plans. Construction of such routes would be to minimal standards, adhering to BMPs (**Appendix E – BMPs**). Temporary routes are not intended to be part of the permanent or designated transportation network system and must be reclaimed when their intended purpose has been fulfilled. Complete reclamation of all temporary routes may not be desired or necessary in all situations. However, unless they are specifically intended for public use, they should not be made available for that use.

BLM would minimize establishing travel routes in areas identified at risk for noxious weed infestations.

In areas with sensitive soils, BLM would minimize establishing new routes and would consider closure, restriction (season or type of use), mitigation (relocation, reconstruction, etc.), or administrative management of existing travel routes.

Travel analysis would be conducted on those routes documented during the inventory period. User-made routes determined to have been created since the inventory would not be brought forward for analysis and therefore are treated as if they are decommissioned.

Short, site-specific sections of road/trail re-alignment, or reconstruction would continue to be implemented as needed to minimize resource damage and/or provide minor reroutes around private property.

BLM manages a number of designated routes where public motorized access is contingent upon the governing consent of their adjoining landowner(s). In these situations, BLM will exercise a reciprocal "All or None road use policy". This means that as long as the public is allowed access to these roads, no changes in travel management would occur. However, should the adjacent landowner refuse public access, then BLM would reciprocate by closing its roads to their use as well.

Alternative A – No Action

All existing travel plans, including the sub-Planning Areas, temporary area closures, and the interagency cooperative mapping effort (Southwest Montana Interagency Visitor/Travel Map) would be brought forward and remain in effect. Travel management for the remainder of the BFO would continue in accordance with the 2003 Statewide OHV ROD.

The ROD did not address snowmobile use. Under Alternative A, all existing snowmobile management would remain in effect. Existing management varies, and includes: unrestricted area cross-country travel (conditions permitting), seasonally restricted area cross-country travel, travel on all wheeled designated routes (during the season of use, December 2 through May 15), and snowmobile use only routes.

Area designations of "Open", "Closed", and "Limited" under Alternative A are characterized in **Table 2-7.**

Table 2-7
Alternative A Field Office Wide Acres of Open, Closed and Limited Area Designations

Designations	Acres[1]
Wheeled Vehicles	
Open	4,367
Closed	31,500
Limited	271,442
Snowmobiles	
Open	143,206
Closed	27,065
Limited	137,038

[1] Acres are approximate.

Applications for competitive, as well as non-competitive organized motorized events would continue to be evaluated on a case by case basis, subject to NEPA analysis. Areas not available to competitive motorized events would include those along lands along the Jefferson, Missouri Rivers, the Beartooth Game Range, the Sleeping Giant area, the Elkhorn Mountains, the Toston/Lombard area, Whitetail/Pipestone, Sheep Mountain, and all WSAs.

Cattle guards/gates would be installed on newly constructed roads/trails as needed.

Road and trail maintenance costs would be expected to continue at the same level.

Management Common to Action Alternatives (B, C, and D)

Area designations Field Office wide would be the same for Alternatives B, C, and D for wheeled vehicles but would vary by alternative for snowmobiles as depicted in **Table 2-8**.

Table 2-8
All Action Alternatives (B, C, and D)
Acres of Open, Closed and Limited Area Designations

Designations	Acres[1]
Wheeled Vehicles (Alternative B, C, and D)	
Open	283
Closed	31,500
Limited	275,526
Snowmobiles	
Alternative B	
Open	112,682
Closed	54,706
Limited	139,921
Alternative C	
Open	26,148
Closed	65,270
Limited	215,891
Alternative D	
Open	139,138
Closed	31,282
Limited	136,889

[1] Acres are approximate.

BLM would maintain current management of existing TPAs and area designations, with the following three exceptions, and one qualification. The exceptions are:

1. The small, scattered open areas located within the Elkhorn Mountains would be converted from open to limited. Existing routes located within the converted areas would remain open to the public;
2. A small (less than one acre) "warm up" area located in the Whitetail-Pipestone Travel Planning Area would be converted from open to limited; and,
3. Approximately one half of the 632-acre Radersburg open OHV use area would be converted from open to limited.

Regarding the qualification, the motorcycle hill climb located in the Whitetail-Pipestone Travel Planning Area would continue to be managed as open, unless resource problems warrant a change in designation at a later time. In addition, the recently acquired Iron Mask property has been proposed to be managed under the limited area designation. If approved, site-specific travel management planning will need to be conducted subsequent to the limited area designation, and will require an amendment to the Elkhorns Travel Plan. These acres are not reflected in **Table 2-8** pending the RMP level decision and remaining pending land acquisition in this same area.

In the context of route-specific travel planning within individual TPAs, BLM's objective would be to use a systematic process that considers the unique resource issues and social environments of each TPA. Specific attributes analyzed would be based on written criteria developed from public and interdisciplinary team input. Areas or sub-areas not analyzed for route-specific management during the course of the RMP revision (due to complexity, controversy, lack of data, or time constraints) would be initiated within five years. Pending their completion, the BLM would, to the extent possible, provide preliminary maps and interim travel management guidelines.

Where private landowners have demonstrated willingness to provide public access across their lands, BLM has shown public access from BLM lands across such private lands in travel plans. Exceptions include routes that BLM has proposed as closed, or are known to be posted or otherwise closed to the public by private property owners. The public must realize that BLM has no control over private roads traveling through private land, and that access across private land is subject to change. A full range of management options would be used for limited designations. Site-specific route management options include: travel limited to designated routes, types or modes of travel such as foot, equestrian, bicycle, motorized; limited to time or season of use; limited to certain types of vehicles (motorcycles, all-terrain vehicles, high clearance, full-size street-legal, etc.); limited to permitted vehicles or users, limited to BLM administrative use only, and other types of limitations as needed. Some pre-existing routes would be closed or decommissioned based on route-by-route travel planning evaluations. Some decommissioned routes would be closed and rehabilitated to blend with the natural surroundings, while others would be permanently closed using earthen berms, fallen trees, or other techniques. All techniques used to decommission roads would eliminate resource impacts.

BLM would cooperate with the MFWP, adjusting seasonal travel restrictions in accordance with big game hunting season extensions.

Roads and trails closed yearlong that are not needed for specific authorized uses (fire prevention/suppression, mining claims, access to private lands, non-motorized travel, etc.) would be rehabilitated to blend into the surrounding area. Roads subject to special uses under authorized exceptions would be stabilized to prevent unnecessary and undue soil erosion and water quality degradation. A priority list for work would be developed after each travel plan is completed.

Travel route densities would conform to the management prescriptions in the wildlife section in the RMP.

Loop-road connections would be established, where appropriate, to enhance public access and enjoyment.

The BLM would emphasize management of the transportation system to reduce impacts to natural resources from authorized roads and trails. The BLM would also stress closing and restoring unauthorized user created roads and trails to prevent resource damage. Ecologically sensitive areas within 300 feet of roads and trails could be closed to dispersed camping if resource damage is found to be occurring in these areas.

Snowmobile use would be subject to restrictions outlined in specific travel plans. It is the rider's responsibility to avoid locations where wind or topographic conditions may have reduced snow depth and created situations where damage to vegetation or soils could occur, or where vegetation is taller than the protective snow cover. Ecologically sensitive areas could be closed to snowmobiling if resource damage caused or exacerbated by snowmobile activity is found to be occurring in these areas.

Alternative B – Preferred Alternative

Opportunities for motorized access across the Planning Area (**Table 2-8**) would be less than with Alternatives A and D, but greater than with Alternative C.

Organized competitive and non-competitive motorized events would be considered and evaluated on a case-by-case basis for the Pipestone area only (existing management). Non-competitive motorized events would not be allowed outside Pipestone. However, competitive motorized events (timed/speed based) proposed on BLM lands outside Pipestone would be considered, but only if held in conjunction with use of adjacent lands (public or private).

With some exceptions (see site specific travel plan alternatives), cross-country snowmobile use would be allowed, as well as travel on all existing routes during the season of use (December 2 – May 15), snow conditions permitting.

BLM would actively seek agency and public easement agreements in order to maintain current access for popularly traveled routes, and seek additional site-specific opportunities as needed.

BLM would replace barbed wire gates (and similar closures) with cattle guards and/or easily operated metal gates wherever problems are known to occur.

The southern portion of Spokane Hills (East Helena TPA) would be available for motorized access by "hunters with a disability". See the Alternative B description for the East Helena TPA for details.

Alternative C

A lower level of motorized access would be provided as Alternative B, with more yearlong closures than any other alternative (**Table 2-8**).

Competitive and organized motorized events would not be allowed.

Unless otherwise managed, snowmobile use would be restricted to designated routes only (open or open/restricted), during the season of use (12/2 to 5/15), snow conditions permitting.

BLM would seek public access easements as needed for new road or trail construction.

Cattle guards/gates would be installed on newly constructed roads/trails as needed.

With the exception of site specific road/trail realignment or reconstruction to minimize resource damage, no new road or trail construction is anticipated.

Alternative D

Opportunities for motorized access Field Office-wide would be less than for Alternative A, but more than for Alternatives B and C (**Table 2-8**).

Management for organized motorized events (competitive and non-competitive) would be the same as for Alternative B.

With some exceptions (see site-specific travel plan alternatives), cross-country snowmobile use would be allowed, as well as travel on all existing routes during the season of use (12/2 to 5/15), snow conditions permitting.

BLM would seek agency and public access easements for all locations where BLM routes are accessed either from, or cross private property.

BLM would replace barbed wire gates (and similar closures) with cattle guards and/or easily operated metal gates wherever they currently exist.

Increased levels of reconstruction and new construction would be necessary to restore deteriorated routes and provide additional loop routes.

Activity Level Planning for Five High Priority Travel Planning Areas

Nested within the Field Office-wide alternatives for travel planning, there are five TPAs for which site-specific travel plan alternatives have been developed. These areas include: Helena, East Helena, Lewis and Clark County NW, Boulder/Jefferson City, and Upper Big Hole River. The following discussion describes these site-specific travel plan alternatives by RMP alternative.

With this document there are two different map formats for site-specific travel plan alternatives. Hard copy ***Maps 6 through 25*** *in the map packet show one travel plan alternative for one Travel Planning Area per map. Due to size and scale limitations however, the hard copy maps do not include route numbers or snowmobile management because they would be too small to read.*

Readers interested in viewing or commenting on numbered routes or snowmobile management will need to refer to the electronic maps on the enclosed compact disk, using the enclosed Adobe Reader software. These maps are located in the "Travel Plan Maps" folder on the disk. In addition to individual route numbers, the electronic maps display geographical locations (road names, towns, streams, mountains, etc.) that will help orient the reader to the Travel Planning Area. The Adobe Reader software allows the reader to search for specific route numbers, "pan" the map, and zoom in on selected features as needed. For both the Helena and Boulder/Jefferson City Travel Planning Areas, each alternative for each of these areas is represented by one electronic map. However, due to the size of the other Travel Planning Areas and scattered distribution of BLM lands there, the remaining Travel Planning Areas are subdivided into sub-areas with one electronic map for each alternative for each sub-area. The East Helena Travel Planning Area is subdivided into four sub-areas. The Upper Big Hole River Travel Planning Area is subdivided into three sub-areas, while the Lewis and Clark County NW Travel Planning Area is subdivided into two sub-areas.

The electronic maps are not numbered, but are instead titled by Travel Planning Area name, sub-area name if needed, and alternative. For example, the title of the electronic map for Alternative B of the Ward Ranch sub-area of the East Helena Travel Planning Area is "East Helena Ward Ranch Alt B.PDF". Names of sub-areas are provided in site-specific descriptions of travel plan alternatives below.

General Overview of Alternative A for Site-Specific Plans

Any existing travel planning for the five TPAs would be brought forward. Existing planning includes "sub-planning" for the Big Hole (Southwest Interagency mapping effort), Sawlog Creek, Great Divide Ski area, and Nez Perce Ridge Road areas. Several "temporary area closures" are in effect as well, including the North Hills, Sawmill Gulch, Ward Ranch, the McMasters, and Spokane Hills.

Additional travel management would continue in accordance with the 2003 Statewide OHV ROD (refer to "Field Office Level Alternative A" for details). Under the ROD, in the absence of other existing travel plan direction, all motorized wheeled travel is restricted to existing roads and trails. An exception allows for motorized wheeled cross-country travel during any military, fire, search and rescue, or law enforcement emergency. The ROD did not address snowmobile use. Under Alternative A, existing snowmobile management would remain in effect. Under the existing management, cross country area use is allowed as well as travel on all existing routes during the season of use (12/2-5/15), snow conditions permitting.

Travel management costs (implementation, routine maintenance, and monitoring) would remain the same.

Working Group Proposal Development

In an effort to help BLM develop site-specific travel management alternatives agreeable to the public as well as the agency, *community based collaborative working groups* were initiated. Two working groups representing a wide, "balanced" range of public land users were recruited and managed under the direct supervision and guidance of the Lewis and Clark County Board of Commissioners. One of the groups was assigned to assist with travel planning for the Helena (Scratchgravel Hills) and East Helena (North Hills) TPAs, and the other for the Lewis and Clark County NW (Marysville) TPA. Membership criteria included: Montana residency, familiarity with the Travel Planning Area(s), and a willingness to work collaboratively with people of differing viewpoints. Members were selected from three different interest categories (in accordance with the Western Montana Resource Advisory Council criteria) in order to provide for balanced representation.

Refer to **Appendix A – Travel Planning** for further details on membership selection, and working group process. Each group held a series of five or six meetings. The meetings were attended by BLM representatives available to answer questions, provide information and feedback from the BLM's interdisciplinary team, and provide written materials and maps as needed. Group recommendations for route-specific management were based on consensus. In the end, the working groups arrived at complete consensus for the Marysville (subset of Lewis and Clark County NW TPA) and North Hills (subset of East Helena TPA) areas, but only partial consensus for the Scratchgravel Hills (subset of Helena TPA) area. BLM incorporated working group recommendations into Alternative B for the three TPAs.

Helena Travel Planning Area

Maps 6 through 9 are the hard copy maps for the Helena TPA alternatives. Electronic maps by alternative showing route numbers are located in the Travel Planning Maps folder on the enclosed disk.

Alternative A – No Action

Other than the 2003 Statewide OHV ROD, there is no existing travel plan management for the Helena Travel Planning Area. Under the ROD, all existing routes would continue to be open yearlong to wheeled motorized travel (**Map 6**). The ROD did not address snowmobile use; area wide cross-country snowmobile use would continue to be allowed as well as travel on all existing routes during the season of use (December 2-May 15), snow conditions permitting. Alternative A would provide the greatest amount of open roads in the Helena TPA (**Table 2-9**).

Alternative B – Preferred Alternative

Travel planning for the Helena TPA focused on the Scratchgravel Hills area. BLM received numerous verbal, as well as written comments during two public scoping meetings for the Scratchgravel Hills area. Many of the comments concerned conflicts between motorized and non-motorized use. Due to the high degree of user conflicts and illegal activity taking place, the BLM has modified the Preferred Alternative for the Scratchgravel

Table 2-9
Helena Travel Planning Area Miles of Road By Proposed Management Category For All Alternatives

	Alt. A	Alt. B	Alt. C	Alt. D
Area available for wheeled, motorized use (in Acres)				
Open	0	0	0	0
Closed	0	0	0	0
Limited	10,164	10,164	10,164	10,164
Miles of wheeled motorized route:				
Open Yearlong	52.2	9.8	7.0	21.9
Seasonally Restricted	0	0	0	0
Closed	0	36.0	40.7	27.7
Decommissioned	0	6.5	4.6	3.1
Area availability for snowmobile use (in Acres)				
Open	10,164	10,164	0	10,164
Closed	0	0	0	0
Limited	0	0	10,164	0
Miles of motorized routes available to snowmobile travel	52.2	52.2	7	52.2
Miles of motorized routes available for snowmobile travel only	0	0	0	0
Miles of routes available for big game retrieval	0	0	0	0
Miles of routes available for disabled hunter access	0	0	0	0
Miles of non-motorized trails available	0	38.6	45.3	30.8

Hills area so that all interior roads in the Scratchgravel Hills would be closed to public wheeled motorized travel yearlong at the five proposed trailheads, with the exception of a few perimeter right-of-way routes and routes to private residences (**Table 2-9, Map 7**). The BLM believes that the revised Preferred Alternative would reduce problems with dumping and illegal activities after dark, and would be more manageable and enforceable than the nighttime closure previously considered for this area in the Draft RMP/EIS.

Cross-country snowmobile use would be allowed, as well as travel on all existing routes during the season of use (December 2 – May 15), snow conditions permitting.

Alternative C

Motorized access to the Scratchgravel Hills area would be restricted to the five existing trailheads (**Table 2-9, Map 8**). No motorized use would be allowed beyond the trailheads. No snowmobile use would be allowed, including the trailhead access routes.

Alternative D

Approximately 41 percent of the existing routes would be available for motorized access.

The majority of the designated routes would be located in the Scratchgravel Hills area. Several new connector routes would need to be constructed; and several existing routes would require reconstruction (**Table 2-9, Map 9).**

Cross-country snowmobile use would be allowed, as well as travel on all existing routes during the season of use (12/2 – 5/15), snow conditions permitting.

East Helena TPA

Maps 10 through 13 are the hard copy maps for the entire East Helena TPA alternatives. Electronic maps showing route numbers are located in the Travel Planning Maps folder on the enclosed compact disk. There are four sub-areas for the East Helena TPA represented on electronic maps titled by alternative as: East Helena North Hills, East Helena Spokane Hills, East Helena Townsend, and East Helena Ward Ranch.

Alternative A – No Action

Under Alternative A, with the exception of existing travel plan management, all existing routes would continue to be open yearlong to wheeled motorized travel as directed by the OHV ROD (**Table 2-10, Map 10**). Existing travel planning includes "temporary area closures" for the North Hills and the recent Ward Ranch, McMasters, and Spokane Hills acquisitions. The North Hills temporary area closure (interagency block hunting management area) restricts motorized access during the big game hunting season. The Ward Ranch, McMasters, and Spokane Hills temporary area closures restrict motorized access to several temporary trailheads, beyond which no motorized travel is allowed.

The ROD did not address snowmobile use. With the exception of the Ward Ranch, McMasters, and Spokane

Table 2-10
East Helena Travel Planning Area Miles of Road by Proposed Management Category for All Alternatives

	Alt. A	Alt. B	Alt. C	Alt. D
Area available for wheeled, motorized use (in acres)				
Open	0	0	0	0
Closed	0	0	0	0
Limited	20,266	20,266	20,266	20,266
Miles of wheeled motorized route:				
Open Yearlong	36.6	13.7	12.0	36.0
Seasonally Restricted -				
Closed 10/15 to 12/1	7.7	0	0	0
Closed 9/1 to 12/1	0	0	0	1.95
Closed 2/14 to 4/16	0	3.3	0	0
Closed	26.4	41.9	54.6	29.7
Decommissioned	0	4.7	4.0	3.1
Area availability for snowmobile use (in acres)				
Open	15,066	6,362	0	14,461
Closed	1,588	13,904	0	5,805
Limited	3,612	0	20,266	0
Miles of motorized routes available to snowmobile travel (in "Limited" areas during season of use, 12/2 to 5/15)	44.3	21.50	12	47.5
Miles of motorized routes available for snowmobile travel only	0	0	0	0
Miles of routes available for big game retrieval	0	7.0	0	0
Miles of routes available for disabled hunter access	0	7.0	0	0
Miles of non-motorized trails available[1]	26.4	47.1	59.1	32.6

[1] includes all existing trails, as well as closed and decommissioned roads.

Hills temporary closures, the East Helena TPA would remain available to cross-country area snowmobile use, as well as travel on all existing routes during the season of use (December 2 – May 15), snow conditions permitting.

Alternative B – Preferred Alternative

The Alternative B proposal represents a combined (merged) effort between the BLM and the community based collaborative working group for the North Hills sub-area. (**Table 2-10, Map 11**). Motorized opportunities would decrease compared to Alternatives A and D. Route 516 would be open yearlong, providing primary access to a non-motorized trailhead at the junction with Route 517. The remaining road network would be seasonally restricted from February 14 to April 16 to prevent soil erosion. An additional non-motorized trailhead would be established at the end of Route 50108. The existing interagency block management hunting area would continue to be managed as in Alternative A. (See electronic map **East Helena North Hills Alt B.PDF**)

With a few minor changes, the Alternative B proposal for the Ward Ranch, McMasters, and Spokane Hills areas would continue in accordance with the existing temporary area closures.

Minor changes for the Ward Ranch area include: Routes 050134 and 050137 would be open yearlong to the public up to the private property boundaries.

The Ward Ranch Trailhead would be brought forward as managed under Alternative A; with no motorized use allowed beyond the current trailhead location. For the McMasters area, motorized access would continue to be restricted to three established, non-motorized trailheads, per the existing temporary closure. Motorized access for the area located on the west side of Prickly Pear Creek (south of Black Sandy) would be restricted to several, primary residential access routes and two recreation use access routes (EH025, EH034). Motorized access to the "Big Bend" area (located northwest of Devils Elbow) would be restricted to route EH037. A non-motorized trailhead would be constructed on the ridge top, near the end of EH 037. (See electronic map **East Helena Ward Ranch Alt B.PDF**)

With the exception of two changes, management for the Spokane Hills area would continue in accordance with the temporary area closure. Under the existing temporary closure, motorized access is restricted to a non-motorized trailhead at the end of route EH087A. The two changes are as follows:

- The southern portion of Spokane Hills would be available for motorized access during the big game hunting season for persons with disabilities. During a two week period, a limited number of hunters possessing a valid Montana State Disabled Conservation License or Permit to Hunt from a Vehicle may be allowed to access the southern Spokane Hills area using identified routes. This access program would be managed through a permit system. The permit requirements or restrictions would be coordinated with the Montana Department of Fish, Wildlife and Parks to ensure hunter safety and a quality hunting experience.
- Outside the special hunt period, the general public would be allowed to use these same identified routes for game retrieval as identified in the East Helena Spokane Hills Travel Management Plan. One route would be available for public access in the Townsend sub-area.

Snowmobile management under Alternative B would be as follows: cross-country travel would be allowed, as well as travel on all existing routes (during the season of use 12/2 – 5/15, snow conditions permitting), for the North Hills, Dana's Bar, and the area located to the west of Prickly Pear Creek (refer to map). The remaining areas (e.g., McMaster Hills, Ward Ranch, and Spokane Hills, etc.) would be closed to all cross-country travel, including travel on existing roads and trails.

Alternative C

Alternative C would provide the least amount of motorized access (**Table 2-10**, **Map 12**).

Routes 0516A and 0516 would provide yearlong access to the North Hills. No other motorized routes would be available in that sub-area. (See electronic map **East Helena North Hills Alt C.PDF**)

Motorized access for the Ward Ranch area would be the same as for Alternative B, except Route 050133A would remain closed at its current location, regardless if the Ward Ranch is vacated in the future. Visitors would park at the current motorized closure area, and walk approximately 0.25 mile to visit the ranch complex. (See electronic map **East Helena Ward Ranch Alt C.PDF**)

As in Alternative B, motorized access for the McMasters area would continue to be restricted to three established, non-motorized trailheads, per the existing temporary closure. There would be no motorized access to the "Big Bend" area. Motorized access for the area located on the west side of Prickly Pear Creek (south of Black Sandy) would be restricted to the primary residential access routes.

Access to the Spokane Hills area would be in accordance with the existing temporary area closure, where, motorized access is restricted to a non-motorized trailhead established at the end of route EH087A. (See electronic map **East Helena Spokane Hills Alt C.PDF**) As in Alternative B, the Townsend sub-area has one route available for public access.

Under Alternative C, snowmobile use would be restricted to designated routes during the season of use (12/2 – 5/15), snow conditions permitting.

Alternative D

Alternative D provides the highest level of motorized access for the North Hills area of the action alternatives, and includes several designated routes not found under Alternative B (**Table 2-10**, **Map 13**). All of the designated routes would be open yearlong. A number of additional designated routes would be available yearlong, as well as one seasonally restricted route. (See routes EH502, EH050133A, EH057, and EH047). (See electronic map **East Helena North Hills Alt D.PDF**)

Motorized access for the McMasters area would increase as well. Under Alternatives A, B, and C, motorized access would be restricted to three established, non-motorized trailheads, however, under Alternative D, a yearlong motorized loop route would be available, accessed from the existing northeast area trailhead. (See routes EH065, EH068A/B, EH068, and EH070 for details). (See electronic map **East Helena Ward Ranch Alt D.PDF**) Motorized access for the area located on the west side of Prickly Pear Creek (south of Black Sandy) would be the same as for Alternative B, with one exception. Under Alternative D, route EH036 (located at the tip of Dana's Bar) would be open yearlong. (See electronic map **East Helena Ward Ranch Alt D.PDF**) Alternative D would provide two designated access routes for the *"Big Bend"* area. (See routes EH037 and EH041). (See electronic map **East Helena Ward Ranch Alt D.PDF**)

Alternative D would provide changes for the Spokane Hills area. Under Alternative D, routes EH 84, 85, 86, and 87 would be open yearlong. The existing trailhead would be relocated to a level bench top area near the end of route EH 084. (See electronic map **East Helena Spokane Hills Alt D.PDF**)

Alternative D would provide two additional, yearlong motorized routes for the Townsend sub-area (see routes EH095 and 96). (See electronic map **East Helena Townsend Alt D.PDF**)

Snowmobile management under Alternative D would be as follows: Cross-country travel would be allowed, as well as travel on all existing routes (during the season of use, 12/2 – 5/15, snow conditions permitting) for the North Hills, Dana's Bar, the area located to the west of Prickly Pear Creek, McMasters Hills, Spokane Hills, and Townsend area (refer to East Helena PDF maps). The Ward Ranch and the Big Bend areas would be closed to all cross-country snowmobile use as well as travel on designated routes.

Lewis and Clark County NW TPA

Maps 14 through 17 are the hard copy maps for the entire Lewis and Clark County NW TPA alternatives. Electronic maps showing route numbers are located in the Travel Planning Maps folder on the enclosed compact disk. There are two sub-areas for the Lewis and Clark County NW TPA represented on electronic maps titled by alternative as: Lewis and Clark Lincoln, and Lewis and Clark Marysville.

Alternative A – No Action

With the exception of existing travel management for the Great Divide Ski (lease) Area, all existing routes would be open yearlong to wheeled motorized travel as directed by the OHV ROD (**Table 2-11, Map 14**). Under current management, with the exception of one or two designated routes, routes located within the Great Divide Ski area would continue to be closed to wheeled vehicles as well as snowmobiles to prevent damage to the ski slopes and prevent conflicts with skiers. The ROD did not address snowmobile use, therefore, outside the Great Divide Ski Area, cross-country snowmobile use would continue to be allowed as well as travel on all existing routes during the season of use (12/2 – 5/15), snow conditions permitting.

Alternative B – Preferred Alternative

The Marysville sub-area represents a combined effort between the BLM and the community-based collaborative working group. Under Alternative B, with the exception of a portion of the northwest corner of the Marysville area, all major motorized access routes would remain available to the public (**Table 2-11**, **Map 15**). The routes within the upper northwest portion would be closed to help provide big game security and protection for threatened and endangered species (grizzly bear, Canada lynx). Cross-country snowmobile travel would be allowed throughout the entire travel planning area, with two exceptions, within the Great Divide Ski area (existing management), and the area identified in the northwest portion of the TPA. Snowmobile use in these areas would be restricted to designated routes only during the season of use (12/2 – 5/15), snow conditions permitting.

The majority of routes in the Sieben Ranch area would remain available for public access, while most of the routes located in the Stemple Pass and Lincoln areas would be closed due to lack of public access and resource impact issues.

Alternative C

There would be no motorized access allowed in the northwest portion of the Marysville area (**Table 2-11, Map 16**).

This alternative provides the least amount of motorized access throughout the TPA of all the alternatives. Snowmobile use would be restricted to designated routes (no cross country use allowed) during the season of use (12/2 – 5/15), snow conditions permitted. With the exception of one change for the Sieben Ranch area, motorized access for the Sieben Ranch, Stemple Pass, and Lincoln areas would be the same as Alternative B.

Table 2-11
Lewis & Clark County NW Travel Planning Area Miles of Road
By Proposed Management Category For All Alternatives

	Alt. A	Alt. B	Alt. C	Alt. D
Area available for wheeled, motorized use (in Acres)				
Open	0	0	0	0
Closed	0	0	0	0
Limited	16,997	16,997	16,997	16,997
Miles of wheeled motorized route:				
Open Yearlong	57.5	13.8	8.0	19.6
Seasonally Restricted (Closed 12/2 to 5/15)	6.7	14.3	11.7	14.5
Closed	3.4	26.8	41.6	20.3
Decommissioned	0	10.9	5.2	8.8
Area availability for snowmobile use (in Acres)				
Open	16,112	12,649	0	12,649
Closed	888	888	888	888
Limited	0	3,463	16,112	3,463
Miles of motorized routes available to snowmobile travel	56.5	49	8	49
Miles of motorized routes available for snowmobile travel only	0	1.8	1.1	2.0
Miles of routes available for big game retrieval	0	0	0	0.5
Miles of routes available for disabled hunter access	0	0	0	0
Miles of non-motorized trails available[1]	5.3	37.7	46.7	29.1

[1] includes all existing trails, as well as closed and decommissioned roads

Alternative D

This alternative provides the greatest amount of motorized access in this area than any of the other alternatives. Under Alternative D, several additional routes would be available for motorized access in the Marysville area (**Table 2-11**, **Map 17**). Examples include a yearlong ATV Only route and a game retrieval route (see routes 63, 65, and 050109 on electronic **Lewis and Clark Marysville Alt D.PDF** map). There would be an additional 2.2 miles of ATV Only route available in this alternative than the other alternatives. Cross-country snowmobile travel would be allowed throughout the entire travel planning area, with two exceptions: within the Great Divide Ski Area and within the area identified in the northwest portion of the TPA. Snowmobile use in these areas would be restricted to designated routes only during the season of use (12/2 to 5/15), snow conditions permitting.

Several additional open yearlong routes would be available for the Stemple Pass and Lincoln areas.

Boulder/Jefferson City Travel Planning Area

Maps 18 through 21 are the hard copy maps for the Boulder/Jefferson City TPA. Electronic maps for the entire TPA showing route numbers are located in the Travel Planning Maps folder on the enclosed CD.

Alternative A – No Action

Other than the OHV ROD, there is no existing travel management for the Boulder/Jefferson City Travel Planning Area. Under the ROD, all existing routes would continue to be open yearlong to wheeled motorized travel (**Table 2-12, Map 18,** electronic map **Boulder Jefferson City Alt A.PDF**). The ROD did not address snowmobile use; area wide cross-country snowmobile use would continue to be allowed as well travel on all existing routes (December 2 – May 15), snow conditions permitting.

Alternative B – Preferred Alternative

Under Alternative B, most major motorized access routes would remain available to the public. (**Table 2-12, Map 19,** electronic map **Boulder Jefferson City Alt B.PDF**), though fewer routes would be open than in Alternative A. Area wide cross-country snowmobile use would continue to be allowed, and travel on all existing routes during the season of use (12/2 – 5/15), snow conditions permitting.

Alternative C

Alternative C provides slightly fewer motorized access opportunities than Alternative B (**Table 2-12**, **Map 20,** electronic map **Boulder Jefferson City Alt C.PDF**). The main difference would be for the southwest corner of the Travel Planning Area, where a number of routes are proposed for closure to enhance non-motorized recreation opportunities (see routes 5115, 510122, 510123A, and BJ040). Snowmobile use would be re-

stricted to designated routes during the season of use (December 2 – May 15), snow conditions permitting.

Alternative D

Alternative D provides for the highest level of motorized access for the Boulder/Jefferson City TPA of the action alternatives, approximately 33 percent more routes than Alternative B (**Table 2-12, Map 21,** electronic map **Boulder Jefferson City Alt D.PDF**). Area wide cross-country snowmobile use would continue to be allowed, and travel on all existing routes during the season of use (12/2 – 5/15), snow conditions permitting.

Upper Big Hole River Travel Planning Area

Maps 22 through 25 are the hard copy maps showing the entire Upper Big Hole River TPA by alternative. Electronic maps showing route numbers are located in the Travel Planning Maps folder on the enclosed compact disk. There are three sub-areas for the Upper Big Hole River TPA represented on electronic maps titled by alternative as: Upper Big Hole Fishtrap, Upper Big Hole Humbug Spires, and Upper Big Hole Jimmie New.

Alternative A – No Action

Existing management for the Upper Big Hole TPA includes the 1996 revised Southwest Montana Interagency Visitor/Travel Map agreement and the 2003 Statewide OHV ROD. The Visitor/Travel Map agreement is a coordinated interagency mapping effort, not a travel planning document per se. The map depicts area wide management as well as site-specific route management for wheeled vehicles as well as snowmobile use (see map). Under Alternative A, the Southwest Travel Plan continues to remain in effect with the exception of several areas, originally designated in 1993 as open to wheeled cross-country (off road) travel. In accordance with the ROD, these open designated areas have been converted to Limited. All existing routes located within these limited areas would continue to be managed as open yearlong to wheeled vehicles. Snowmobiles use within these same Limited areas would continue to be managed as open to area wide cross-country use as well as use on all existing routes during the season of use (12/2 – 5/15), snow conditions permitting (**Table 2-13, Map 22**).

Alternative B – Preferred Alternative

Existing management under the Southwest Interagency travel plan would remain in effect in some sub-areas of the Upper Big Hole TPA, but would change in other areas. Several sub-areas of the Southwest Interagency travel plan, originally designated in 1993 as open to wheeled cross country (off road) travel, have been converted to a limited designation in accordance with the 2003 Statewide OHV ROD. By default, all existing routes within these converted limited areas are currently managed as open yearlong to wheeled vehicles. In many cases the management for these routes would change from open yearlong, to seasonally restricted (as needed) in order to maintain consistency with the Southwest Interagency travel plan (see **Table 2-13, Map 23**).

Under Alternative B, all major motorized access routes located between Humbug Spires and Camp Creek would

Table 2-12
Boulder/Jefferson City Travel Planning Area Miles Of Road by Proposed Management Category For All Alternatives

	Alt. A	Alt. B	Alt. C	Alt. D
Area available for wheeled, motorized use (in Acres)				
Open	0	0	0	0
Closed	0	0	0	0
Limited	14,487	14,487	14,487	14,487
Miles of wheeled motorized route:				
Open Yearlong	60.5	3.7	3.0	5.3
Seasonally Restricted (Closed 12/2 to 5/15)	0	25.1	20.5	32.8
Closed	0	29.0	34.2	20.6
Decommissioned	0	2.7	2.7	2.7
Area availability for snowmobile use (in Acres)				
Open	14,487	14,487	0	14,487
Closed	0	0	0	0
Limited	0	0	14,487	0
Miles of motorized routes available to snowmobile travel	60.5	60.5	3	60.5
Miles of motorized routes available for snowmobile travel only	0	0	0	0
Miles of routes available for big game retrieval	0	0	0	0
Miles of routes available for disabled hunter access	0	0	0	0
Miles of non-motorized trails available[1]	0	33.2	36.9	23.3

[1] includes all existing trails, as well as closed and decommissioned roads

remain available to the public. Some existing seasonal use restrictions would be changed to enhance high elevation hunting opportunities (refer to routes 0200, 010113, 0115, and 0150). (See electronic map **Upper Big Hole Humbug Spires Alt B.PDF**)

Under Alternative B, most major motorized access routes located in the Jimmie New Creek area would remain available to the public. Existing management for the Nez Perce Ridge Road and the "temporary area closure" for Sawmill Gulch would remain in effect. Changes from Alternative A include a moderate reduction in road density for the area located north of Highway 43, bounded by the Johnson and Jerry Creek access routes. The reduction in road density would help provide big game security as well as enhanced opportunities for non-motorized recreation. (See electronic map **Upper Big Hole Jimmie New Alt B.PDF**)

For the Fishtrap Creek area, the most notable change from Alternative A concerns Sawlog Gulch, a popular big game hunting area located approximately 2 miles southwest of the Fishtrap fishing access site on the south side of the Big Hole River. Under existing management (Alternative A), yearlong motorized access is allowed (fording the river). Under Alternative B, motorized wheeled vehicle access would be seasonally restricted (closed 12/2 to 7/15). (See Route 189009B on electronic map **Upper Big Hole Fishtrap Alt B.PDF**)

This change would help prevent resource damage by minimizing the number of vehicular crossings of the Big Hole River, improve big game security, and help provide public safety during high water conditions (spring runoff).

Note: If possible, in the future BLM would like to close route #189009b, and provide alternate access to the Sawlog area via route BH252 or routes BH189003 and BH001. Route BH252 is the preferable alternate access route. BH252 provides a safer river crossing and quicker access to the higher elevations that most users (big game hunters) seek. Access via route BH252 will require USFS and State cooperation; the USFS has already indicated its cooperation. Routes BH189003 and BH001 eliminate the need for a river crossing; but require several miles of travel in order to reach the Sawlog area. Access across these routes is largely dependent on private property cooperation.

Under Alternative B, existing snowmobile management would continue to remain substantially in effect as represented by the 1996 Southwest Interagency Visitor/ Travel Map. However, several additional areas would be closed to cross-country travel, and others restricted to existing designated routes and trails during the season of use (December 2 – May 15), snow conditions permitting. Proposed cross-country closures include the area located between the Soap Gulch and Camp Creek roads, the Goat Mountain / Maiden Rock area and the Sawmill

Table 2-13
Upper Big Hole Travel Planning Area Miles Of Road By Proposed Management Category For All Alternatives

	Alt. A	Alt. B	Alt. C	Alt. D
Area available for wheeled, motorized use (in acres)				
Open	0	0	0	0
Closed	0	0	0	0
Limited	63,249	63,249	63,249	63,249
Miles of wheeled motorized route:				
Open Yearlong	70.6	26.9	19.2	26.8
Seasonally Restricted (Total)	88.0	57.9	40.8	70.6
Closed 9/1 to 12/1	0	0	0	1.6
Closed 10/15 to 12/1	25.2	0.2	0.2	0
Closed 10/15 to 5/15	10.5	17.6	5.5	11.4
Closed 12/2 to 4/15	2.2	2.2	1.9	0
Closed 12/2 to 5/15	50.2	34.6	32.8	54.1
Closed 12/2 to 6/15	0	0.9	0.4	2.6
Closed 12/2 to 7/15	0	0.8	0	0.9
Closed	7.4	49.2	69.3	33.2
Decommissioned	0	27.7	33.5	25.7
Area availability for snowmobile use (in acres)				
Open	31,600	13,243	0	31,600
Closed	31,607	46,932	31,607	31,607
Limited	0	3,032	31,600	0
Miles of motorized routes available to snowmobile travel	90.2	53	14	90.2
Miles of motorized routes available for snowmobile travel only	0	2.5	2.4	2.5
Miles of routes available for big game retrieval	0	1.1	0	6.6
Miles of routes available for disabled hunter access	0	0	0	0
Miles of non-motorized trails available[1]	11.0	83.5	106.9	62.9

[1]Includes all existing trails, as well as closed and decommissioned roads

Gulch/Nez Perce Ridge area. Snowmobile use in the Dewey area would be restricted to designated routes and trails during the season of use (12/2 – 5/15), snow conditions permitting.

Alternative C

Alternative C would provide moderately fewer motorized access opportunities than for Alternative B (**Table 2-13, Map 24C**). Under Alternative C, big game security and non-motorized recreational opportunities would be enhanced through additional route closures.

Most major motorized access routes located in the Humbug Spires area would remain available to the public. Differences from Alternatives A and B include additional yearlong closures for the high elevation routes located between the Soap Gulch and Camp Creek travel corridors. Examples include routes 0110, 010119, 127, 010115, 138, and 139. (See electronic map **Upper Big Hole Humbug Spires Alt C.PDF**)

Most major motorized access routes located in the Jimmie New Creek area would remain available to the public. Existing management for the Nez Perce Ridge Road; and the "temporary area closure" for Sawmill Gulch would remain in effect. Differences include additional yearlong closures for the area located north of Highway 43, bounded by the Johnson and Jerry Creek access routes. See routes 10109 and 033. (See electronic map **Upper Big Hole Jimmie New Alt C.PDF**)

The reduction in road density would help provide Big Game security as well as enhanced opportunities for non-motorized recreation. For the Fishtrap Creek area, the most notable change from Alternatives B and C concerns Sawlog Gulch. Under Alternative C, the Sawlog Gulch route (189009B) would be closed yearlong. (See electronic map **Upper Big Hole Fishtrap Alt C.PDF**) For areas open to snowmobile use under the Southwest Montana Interagency Visitor/Travel Map, travel would be restricted to designated routes only. No cross-country travel would be allowed.

Alternative D

Alternative D provides the highest level of motorized access for the Planning Area of all the action alternatives, approximately 33 percent more routes than found under Alternative B (**Table 2-13, Map 25**).

Several additional routes would be available compared to Alternatives B and C for the Humbug Spires area. Other differences include adjusting existing seasonal route restrictions to allow for high elevation big game hunting access. Examples include routes 0110, 010119,122, 123, 141, and 148. (See electronic map **Upper Big Hole Humbug Spires Alt D.PDF**)

Under Alternative D, several additional routes would be available for the Jimmie New Creek area, including game retrieval routes. Notable examples include routes 010100, 032, 010101, 010102, 010110, 189012, 189016, 026, and 051. (See electronic map **Upper Big Hole Jimmie New Alt D.PDF**)

For the Fishtrap Creek area, the Sawlog Gulch route (189009B) would be managed the same as under Alternative B, open/restricted, with a seasonal closure from 12/2 to 7/15. (See electronic map **Upper Big Hole Fishtrap Alt D.PDF**)

Snowmobile management would be the same as described for Alternative A.

TRANSPORTATION AND FACILITIES

Goal 1 – Maintain facilities, roads, and trails to provide for public and/or administrative use and safety while mitigating impacts to resources.

Management Common to All Alternatives

Transportation and road management activity would meet, or move toward meeting Land Health Standards.

Comprehensive assessments would be conducted for all maintained roads and facilities and maintenance actions would be implemented as needed.

Roads and trails would be maintained in accordance with Travel Management Plan guidance and BLM policy. After site-specific travel plan decisions are made, roads included in the transportation system would be assigned maintenance levels, if needed. Roads would be managed in accordance with assigned maintenance levels and in consideration of resource issues. All roads and trails would be maintained in accordance with standards and guidelines in BLM Handbook 9113-2 and Manual Section 9114 respectively. Roads and trails would be inspected on an established schedule in accordance with the Bureau's Condition Assessment guidance.

Recreation sites, administrative sites, buildings, and bridges would be maintained within Bureau standards to reduce deferred maintenance costs; meet public health and safety requirements; provide universal accessibility as appropriate and to enhance visitor experiences. These activities would be coordinated with other federal, state, and local government agencies, private landowners and the general public as needed.

New roads and trails determined to be necessary for permanent or long-term use as part of BLM's transportation system would be constructed subject to NEPA and approved engineering standards. Consideration would be given to use demands, location, safety, and resource constraints when determining the level of road necessary, in accordance with Manual Section 9113. Where a new permanent road would provide better access, existing routes in the vicinity would be identified for closure and decommissioning in order to meet travel plan guidance and resource mitigation concerns (wildlife dis-

placement, habitat fragmentation, VRM, ROS, soil stability, water quality, etc).

Management Common to Action Alternatives (B, C, and D)

Roads would be built to the minimum standard necessary that allows reasonable access and has the least impact on resource values.

If an existing road is substantially contributing to the standards not being met, the road would be considered for redesign, closure, or decommissioning to minimize the adverse impacts.

Alternative B – Preferred Alternative

Road designs would include at a minimum:

- Minimizing road and landing locations in Riparian Management Zones;
- Minimizing sediment delivery to streams from road surfaces;
- Outsloping roadway surfaces where possible, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe;
- Routing road drainage away from potentially unstable stream channels, fills and hill slopes;
- Minimizing disruption of natural hydrologic flow paths; and,
- Minimizing sidecasting of soil or snow.

Roads would be designed and maintained in a manner that provides for water quality protection by controlling placement of fill material, keeping drainage facilities open, installing and maintaining appropriately-sized culverts at stream crossings, and by repairing ruts and failures to reduce erosion and sedimentation of aquatic habitats.

Alternative C

Road design considerations would include the same items listed above in Alternative B.

Roads would be designed and maintained in a manner that provides for water quality protection by controlling placement of fill material, keeping drainage facilities open, installing and maintaining stream crossings capable of accommodating 100-year storm events including associated sediment and debris, and by repairing ruts and failures to reduce erosion and sedimentation of aquatic habitats.

Alternative D

Transportation and road management activity would meet, or move toward meeting Land Health Standards. Road designs would consider at a minimum:

- Minimizing road and landing locations in Streamside Management Zones;
- Minimizing sediment delivery to streams from roads surfaces;
- Outsloping roadway surfaces where possible, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe;
- Routing road drainage away from potentially unstable stream channels, fills and hill slopes;

Roads would be designed and maintained in a manner that provides for water quality protection by controlling placement of fill material, keeping drainage facilities open, installing and maintaining appropriately-sized culverts at stream crossings, and by repairing ruts and failures to reduce erosion and sedimentation of aquatic habitats.

RECREATION MANAGEMENT

Goal 1 – Provide a diverse array of recreational opportunities while maintaining healthy public land resources.

Goal 2 – Establish, manage, and maintain quality recreation sites and facilities to meet a broad range of public needs subject to resource constraints.

Goal 3 – Manage commercial, competitive, or special events with special recreation permits that eliminate or minimize impacts on resources and conflicts with other users.

Goal 4 – Manage recreation opportunities to provide a sustained flow of local economic benefits and protect non-market economic values.

Management Common to All Alternatives

"Leave No Trace" and "Tread Lightly" practices would be promoted to enhance the sustainability of resource-based activities.

BLM would support events that emphasize collaborative outreach and public awareness such as National Public Lands Day, National Fishing Week, Great Outdoors, National Trails Day, and others to promote public stewardship.

BLM would support and utilize volunteer participation and recruit and train volunteers to provide effective visitor contact assistance.

BLM would continue to provide a diverse range of quality recreation opportunities and experiences within the BFO commensurate with public demands, resource considerations, and management capabilities.

The BFO would follow BLM program direction for managing recreation on public lands by incorporating

"The BLM's Priorities for Recreation and Visitor Services", applicable sections of Appendix C of the Land Use Planning Handbook (USDI-BLM 2005a), and other BLM directives that are related to recreation management.

Comparable, cost effective and value based fee systems would be established for services and facilities provided to public users in accordance with the Butte Field Office Recreation Fee Area (MT-02) Business Plan, BLM directives and the Federal Lands Recreation Enhancement Act. BLM would strive to update the above Business Plan every five years to ensure site fees are appropriate over time using fair market values and cost recovery assessments.

There are no known significant caves or karsts in the Decision Area. Should these resources be discovered, BLM would develop management plans that address management, marketing, monitoring and administrative needs appropriate for the specific resource in accordance with Bureau directives.

Recreation users would be limited to 14-day camping stays with the following exceptions:

- The 7-day camping limit at Holter Lake Sites (Holter Dam, Holter Lake, Log Gulch, and Departure Point) would continue during the high-use fee season (Memorial Day to Labor Day) weekends.
- The 7-day rule would be implemented, as needed, at other sites if camping demands frequently exceed capacities during the high-use fee season (Memorial Day to Labor Day) weekends.
- Comply with Bureau directives governing dispersed camping in undeveloped areas throughout the Field Office.

Personal property of recreational users could not be unattended for more than 24 hours at recreation sites or for more than 72 hours on other BLM lands.

BLM would establish and maintain information kiosks with site maps, brochures, interpretive and educational information, important contacts, and site regulations at recreation sites.

BLM would maintain and develop a web-site of BLM recreation sites and areas that provides access information and available opportunities.

BLM would conduct periodic visitor satisfaction surveys and distribute annual fee collection and accomplishment reports to the public and encourage continual feedback from visitors.

BLM would strive to enhance voluntary compliance among recreation users through effective public education outreach efforts.

BLM would continue to conduct periodic accessibility, safety, and condition assessments in accordance with Bureau policy at developed recreation sites. Prioritize available funds to resolve deferred and corrective maintenance needs.

BLM would conduct annual evaluations of all fee sites that address project needs, support equipment, visitor services, public comments, administrative needs, fees, site regulations, and conflict concerns.

Continue to establish partnership agreements that are mutually beneficial to BLM and the public and maintain them to enhance comprehensive planning, collaborative management, and collective funding.

- The highly successful partnership with Pennsylvania Power and Light – Montana (PPLM) would be continued during the life of the project license within the Missouri River corridor and agreements made under the Missouri/Madison Comprehensive Recreation Plan would be fulfilled.
- Challenge Cost Share opportunities and grants to offset funding shortages would be sought and utilized.
- Working relationships with tourism organizations, recreation interest groups, and local/state/other federal governments would be maintained and expanded to enhance visitor services, management efficiencies, and recreation opportunities.
- BLM would strive to maintain the existing agreement with FWP that establishes partnership efforts and responsibilities to collectively manage the Black and White Sandy sites on Hauser Lake.
- BLM would pursue opportunities to expand day-use parking capacities on Holter Lake in cooperation with the Missouri/Madison Comprehensive Recreation Plan.

BLM would continue to issue special recreation use permits as appropriate for non-motorized commercial, competitive, and special events subject to 2930 Handbook guidance, resource capabilities, social conflict concerns, professional qualifications, public safety, and public needs. New permits that directly conflict with established special recreation use permits would not be authorized. Existing permittees would be given preference. (Organized motorized events are addressed in the Travel Management section.)

BLM would continue to prioritize funding and management efforts at developed recreation sites that receive the heaviest visitation rates. Sites that cannot be managed to acceptable health and safety standards would be closed until deficiencies are corrected.

Alternative A

No fees would be charged for commercial fishing and floating outfitters using developed BLM river access sites.

Variances (extensions) to the 14-day camping limit would be considered on a case-by-case basis subject to the following considerations: resource impacts, social conflicts, sanitation concerns, no livestock, or commercial activities would be involved.

BLM would continue to allow recreational activities including motorized vehicle uses within the Scratchgravel Hills 24 hours/day.

Authorization of commercial camping activity would be considered throughout the Field Office on a case-by-case basis subject to resource constraints, management capabilities, social conflicts, and public health and safety concerns.

Permit requests by outfitter and guide hunters would be considered on a case-by-case basis throughout the Field Office subject to environmental, social, and public health and safety concerns.

Boat-in camping would continue to be allowed on BLM shoreline lands on Hauser and Holter Lakes subject to current regulations only.

Management Common to Action Alternatives (B, C, and D)

BLM would establish designated boat-in camp sites along the shoreline of Holter Lake and consider a similar designation effort for the Hauser Lake shoreline, should resource concerns warrant.

In accordance with policy guidance (IM No. 2004-150), a greater priority would be placed on extending appropriate, reoccurring permits from five years to 10 years.

BLM would coordinate with MFWP to manage appropriate uses at BLM launch sites as necessary to ensure quality recreation opportunities and experiences on State waters and affected BLM lands are collectively managed.

New sites would be developed commensurate with public demand, resource constraints, and management capabilities. Priority would be given to new sites that have partnership funding strategies and are consistent with established ROS and SRMA management guidelines.

If an existing developed recreation site significantly contributes to Land Health Standards not being met, the impacts from the site would be minimized to the extent possible.

All new recreation sites would be designed, constructed, and managed to meet, or move toward meeting, Land Health Standards.

Alternative B – Preferred Alternative

Day-use Special Recreation Permits would be issued for commercial fishing and floating uses at BLM river access sites. Outfitters would be annually billed an advance flat fee (currently $90.00) established by the Director based on the Implicit Price Deflator Index. In the long-term, the BLM would continue to coordinate with MFWP to enhance river/corridor land management and to possibly develop a multi-agency statewide fee system for the commercial uses of river access sites.

Variances to the 14-day camping limit during the hunting season would be considered on a case-by-case basis subject to the following considerations: resource impacts, social conflicts, sanitation concerns, no livestock, or commercial activities would be involved. Preference will be given to developed recreation sites during this low use period since they provide hardened camping units, toilet facilities, and good access.

The interior portions of the Scratchgravel Hills area would be closed to motorized vehicle use yearlong except on limited routes needed for residential access. Signs and gates would be installed at appropriate access points to notify users of the closures.

Commercial camping permits within developed fee sites would not be allowed during the fee season (Memorial Day to Labor Day).

In order to reduce user conflicts and resource impacts, special recreation use permits during the hunting season would be limited to day-use activities with the exception that camping uses would be considered within developed recreation sites with hardened camping units during the non-fee season.

Boat-in camping at dispersed sites (excluding Beartooth Landing) on BLM lands along the east shoreline of Holter Lake would be limited to designated sites only. Site availability would be determined through field evaluations by an interdisciplinary team. Suitable sites where impacts to other important resources (wildlife, cultural resources, riparian, vegetation, etc.) are acceptable would be designated, signed, and available to the public on a first-come, first-served basis. A similar management system would be undertaken for BLM lands on Hauser Lake should conditions warrant.

Under Alternative B, human food storage regulations would be developed and implemented for all recreation sites with high potential and/or known encounters between people and bears.

Alternative C

Day-use Special Recreation Permits would be issued for each commercial fishing and floating outfitter that uses developed BLM river access sites. Outfitters would be billed in advance at a rate of $90.00 per year. Final bills would be assessed based on actual use reports and established BLM policies. An estimated additional 200 to 300 permits per year would need to be processed.

No variances to 14-day camping limits would be allowed.

Commercial camping permits within developed fee sites would not be allowed during the fee season (Memorial Day to Labor Day).

Special recreation use permits during the hunting season would be limited to day-use activities only.

The entire BLM shoreline along Hauser and Holter Lakes excluding developed sites would be closed to camping.

Like in Alternative B, human food storage regulations would be developed and implemented for all recreation sites with high potential and/or known encounters between people and bears.

Alternative D

BLM would postpone fees for commercial fishing and floating outfitters using developed BLM river and lake sites accessing state waterways until a multi-agency statewide fee system is established. Under this system BLM would receive a portion of collections based on a percentage of total sites under the statewide system. This system would be customer friendly and would ensure interagency coordination for managing uses on state waterways.

Like Alternative B, variances to the 14-day camping limit would be considered on a case-by-case basis subject to the following considerations: resource impacts, social conflicts, sanitation concerns, no livestock, or commercial activities would be involved. Preference will be given to developed recreation sites during this low use period since they provide hardened camping units, toilet facilities, and good access.

Motorized and non-motorized recreational uses would be allowed 24 hours/day in the Scratchgravel Hills area in accordance with the travel management plan.

Authorization of commercial camping activity would be considered throughout the Field Office on a case-by-case basis subject to resource constraints, management capabilities, social conflicts, and public health and safety concerns.

Permit requests by outfitter and guide hunters would be considered on a case-by-case basis throughout the Field Office subject to environmental, social, and public health safety concerns.

Boat-in camping along the BLM shoreline on Hauser and Holter Lakes would continue under current regulations.

Recreation Sites

Management Common to All Alternatives

Recreation sites and facilities would be maintained and managed to promote resource value protection, public safety and health, quality facilities, visitor experiences, management efficiency, and value based returns. These sites are listed by recreation management areas in Chapter 3. The location of these sites is displayed on **AMS Figures 2-24a, 2-24b,** and **2-24c**.

Recreation Opportunity Spectrum

Alternative A – No Action

There would be no ROS classifications to identify and map essential landscape settings to meet public preferences and manage recreation-related experience expectations. Recreation opportunities would be evaluated on a case-by-case basis as part of project planning.

Management Common to Action Alternatives (B, C, and D)

Under the action alternatives, an objective would be to manage ROS classes for desired recreation opportunities, experience levels, facility developments, and other resource uses. **Appendix H – Recreation Opportunity Spectrum** contains a description of ROS categories.

Alternative B – Preferred Alternative

Recreation settings and opportunities would be managed in accordance with the classifications in **Table 2-14** and **Map 26**. This alternative emphasizes slightly more motorized recreation than Alternative C but less than Alternative D.

Table 2-14
Alternative B Proposed ROS

ROS Class	Acres[1]
Semi-Primitive Non-Motorized	36,800
Semi-Primitive Motorized	71,800
Roaded Natural	171,100
Roaded Modified	16,600
Rural	11,000

[1] Acres are approximate and rounded to nearest 100.

Alternative C

Recreation settings and opportunities would be managed in accordance with the classifications in **Table 2-15** and **Map 27**. This alternative provides for the greatest amount of non-motorized recreation, and less motorized recreation than any of the action alternatives.

Table 2-15
Alternative C Proposed ROS

ROS Class	Acres[1]
Semi-Primitive Non-Motorized	63,700
Semi-Primitive Motorized	66,900
Roaded Natural	158,100
Roaded Modified	15,900
Rural	2,700

[1] Acres are approximate and rounded to nearest 100.

Alternative D

Recreation settings and opportunities would be managed in accordance with the classifications in **Table 2-16** and **Map 28**. This alternative provides for the greatest amount of motorized recreation, and the least amount of non-motorized recreation than any of the alternatives.

Table 2-16
Alternative D Proposed ROS

ROS Classes	Acres[1]
Semi-Primitive Non-Motorized	30,000
Semi-Primitive Motorized	37,600
Roaded Natural	186,100
Roaded Modified	19,600
Rural	34,000

[1] Acres are approximate and rounded to the nearest 100.

Special Recreation Management Areas (SRMAs)

Management Common to All Alternatives

The management objective for Special Recreation Management Areas would be to meet the needs for their primary recreation tourism markets, needed recreation management zones, Recreation Opportunity Spectrum, and primary recreation opportunities. Special Recreation Management Areas would be designated under all alternatives to guide recreation management priorities. The remaining BLM lands not designated as SRMAs would be managed as an Extensive RMA. This area would be managed on a lower priority basis with a few exceptions at some specific sites/locations due to use concentrations, resource concerns, and/or public demand.

Alternative A – No Action

Planning efforts, recreation opportunities and management would continue to be prioritized at the five Special Recreation Management Areas (Holter Lake/Sleeping Giant, Lewis & Clark National Trail, Upper Big Hole River, Humbug Spires, and Scratchgravel Hills) displayed on **Map 29**. The remainder of the field office, identified as the Headwaters Extensive Recreation Management Area, would be managed on a custodial or lower priority basis with a few exceptions at some specific sites.

Management Common to Action Alternatives (B, C, and D)

Implementation plans for Special Recreation Management Areas (SRMAs) and delineated Recreation Management Zones would be developed where specific management, marketing, monitoring and administrative guidance is needed.

Although designation of SRMAs varies under the action alternatives by alternative, if designated, **Table 2-17** indicates the primary recreational management strategy (primary recreation tourism market, needed recreation management zones, ROS, and primary recreation opportunities) for each of the potential SRMAs.

Alternative B – Preferred Alternative

Nine SRMAs would be designated for priority management. This alternative would establish two new areas (Pipestone and Sheep Mountain); split the Holter Lake/Sleeping Giant SRMA into two separate areas (Sleeping Giant/Missouri River and Lower Holter Lake/Missouri River given their distinctly separate Recreation Tourism Markets (RTMs)); and replace the Lewis & Clark Trail with two priority areas (Hauser Lake and Uppermost Missouri River).

These nine SRMAs are depicted on **Map 30**. These areas are:

- Lower Holter Lake/Missouri River,
- Sleeping Giant/Missouri River,
- Hauser Lake,
- Uppermost Missouri River,
- Scratchgravel Hills,
- Sheep Mountain,
- Pipestone,
- Upper Big Hole River, and
- Humbug Spires.

Two new areas, Pipestone and Sheep Mountain, would be designated as SRMAs. Planning guidance would include area specific travel management plans, recreation site plans, ROS and VRM classifications and other directives.

Alternative C

The same nine SRMAs designated in Alternative B would also be designated in Alternative C. These SRMAs are depicted on **Map 30**.

Alternative D

Five SRMAs would be designated for priority management. Management would focus on the most developed and heavily used BLM areas. These five SRMAs are depicted on **Map 31**. The areas are:

- Lower Holter Lake/Missouri River,
- Hauser Lake,
- Uppermost Missouri River,
- Pipestone, and
- Upper Big Hole River.

Table 2-17
Management of Special Recreation Management Areas

SRMA	Recreation Tourism Market	Recreation Management Zones	ROS	Primary Recreation Opportunities
Lower Holter Lake/Missouri River	Community	One	Rural	Developed camping and day-use activities, lake access for motorized boating, fishing, swimming, picnicking, and group gatherings.
Sleeping Giant/ Missouri River	Undeveloped	Two subunits: Sleeping Giant ACEC/Preliminarily WSR reach of Missouri R. above Holter Lake and non-ACEC portion of Sleeping Giant	ACEC/Eligible W&SR Lands; Semi-Primitive, Non-motorized Non-ACEC; Semi-primitive, Motorized	ACEC Eligible W&SR Lands; Primitive shoreline camping, fishing, hiking, hunting, horseback riding and natural viewing. Non-ACEC; Limited motorized travel, pleasure driving, hunting, horseback riding and natural viewing.
Lewis & Clark National Trail	Community	One	Primarily Roaded Natural	Developed camping and day-use activities, lake access for boating/floating, fishing, swimming, picnicking, and group gatherings.
Scratchgravel Hills	Community	One	Rural	Hiking, mountain biking, horseback riding, hunting, and driving for pleasure.
Pipestone	Community	One	Roaded Natural	OHV riding, driving for pleasure, semi-developed camping, hunting, horseback riding, hiking and mountain biking.
Upper Big Hole River	Destination	One	Primarily Roaded Natural	Semi-developed camping, limited motorized pleasure driving, river access for floating and fishing, fall hunting, hiking and natural viewing.
Humbug Spires	Undeveloped	One	Semi-primitive, Non-motorized	Hiking, backpacking, rock climbing, primitive camping, fishing, and hunting.
Hauser Lake	Community	One	Hauser Lake: primarily Roaded Natural	Hauser Lake: Developed camping, lake access for boating, fishing, swimming, picnicking, and group gatherings.
Uppermost Missouri River	Community	One	Primarily Rural	Semi-Developed camping, lake access for motorized and non-motorized boating, fishing, picnicking and upland hunting.
Sheep Mountain	Community	Two sub-units separated by Sheep Mountain Access road	Northern sub-unit; Semi-primitive, Non-motorized Southern sub-unit; Roaded Natural	Northern sub-unit; Hiking, rock climbing, hunting and natural viewing. Southern sub-unit; OHV riding, driving for pleasure, semi-developed camping, and hunting.

SPECIAL DESIGNATIONS

Including Areas of Critical Environmental Concern (ACECs), National Trails, Wild and Scenic Rivers and Wilderness Study Areas (WSAs)

ACECs

Goal – Designate ACECs where special management attention is required to protect important and relevant values.

Management Common to All Alternatives

The Sleeping Giant ACEC would continue to be managed as an ACEC. While this ACEC was identified as being 11,609 acres when it was originally designated, more accurate GIS calculations based on its original boundaries indicate a size of 11,679 acres.

Alternative A – No Action

No new ACECs would be established. The pre-existing Sleeping Giant ACEC (11,679 acres) would continue to be managed under the original management plan.

Management Common to Action Alternatives (B, C, and D)

Information on the relevant and important values evaluations of the five potential ACECs reviewed in this planning process is summarized in **Table 2-18,** Chapter 3, and **Appendix I – ACECs**. The general location of the five Potential ACECs is shown on **Map 32**. Boundaries of Sleeping Giant, Humbug Spires, Spokane Creek, and Ringing Rocks potential ACECs would be the same (as shown on **Map 32**) in all alternatives in which they are individually proposed. **Map 32** displays proposed ACEC designations under Alternative C in which all potential ACECs would be proposed. Boundaries of the Elkhorns potential ACEC vary by alternative as described and shown below.

In discussions of each individual ACEC below, general management direction is characterized by major management activity category. Special management prescriptions are designated as such:

- *special management prescriptions*

Relevant and important values in areas not proposed for ACEC designation under a given RMP alternative would be managed in accordance with the direction specified for each resource or program under that particular alternative.
In the event that WSAs designated as ACECs become designated as wilderness, ACEC management would be dropped upon development of wilderness management plans.

Sleeping Giant ACEC

Sleeping Giant ACEC (11,679 acres) would be managed as an ACEC under all action alternatives under its original management plan with the following modifications. Management direction is characterized by major management category in the existing plan.

- *Area would be closed to all new rights-of-way. Maintenance of the existing Towhead/Falls Gulch Power line would be allowed. Future upgrades would be authorized provided impacts to the ACEC resources are not degraded.*
- *Discretionary management actions would only be allowed to protect or enhance ecosystems, and long-term ACEC values (naturalness, primitive and unconfined forms of recreation, solitude experiences, visual resources, native wildlife, and cultural resources).*

Table 2-18
Potential ACECs

ACEC	Relevant and Important Values
Sleeping Giant	• Outstanding scenic qualities. • Diverse upland and aquatic habitat for wildlife and fish.
Elkhorn Mountains	• Important cultural/historic sites. • Diverse upland and aquatic habitat for wildlife and fish. • Unique National management area.
Spokane Creek	• Natural aquatic and riparian habitat. • Critical fish spawning stream for Hauser Lake.
Ringing Rocks	• Rare and unique geological rock feature.
Humbug Spires	• Outstanding scenic qualities. • Unique geological features. • Diverse upland and aquatic habitat for plants, animals, and fish.

❖ *For the entire river/lake shoreline, the existing livestock grazing restrictions outlined in the current grazing lease and Oxbow Allotment Management Plan would continue to be implemented. BLM would cooperatively work with the lessee to restrict and/or manage livestock grazing along the river/lake shoreline from Memorial Day weekend through Labor Day weekend to enhance primitive recreation experiences, soil/water quality conditions, visual resources, and natural values.*

- BLM would seek opportunities to allow for prescribed natural fires and develop a coordinated management plan if appropriate.
- In addition to controlling noxious weeds through chemical and biological means, mechanical (hand pulling) efforts would also be utilized where practical.
- ROS management for the ACEC would be semi-primitive non-motorized.
- With the exception of the Beartooth Landing Site, docks would not be authorized at the primitive shoreline sites.

❖ *Cutting of dead and down material for firewood would not be allowed unless specifically authorized.*

❖ *Aerial spraying along the streams and river (300 feet from water) would be prohibited.*

Humbug Spires Potential ACEC

The Humbug Spires potential ACEC (8,374 acres) would be managed as an ACEC under all action alternatives under the following management guidance. Management direction is characterized by critical resource and resource use categories below.

Recreation Opportunity Spectrum

- ACEC would be managed for Semi-Primitive Non-motorized experiences.

Motorized Travel Management

- Area would be closed yearlong to all motorized travel in order to protect natural and scenic values.

❖ *No new roads or motorized trails would be authorized.*

- Motorized route closures would be managed within the area in accordance with the Upper Big Hole River Travel Plan.

Visual Resource Management

- ACEC would be managed for VRM Class II objectives.

Land Ownership/Adjustment

- All BLM lands would be retained in the ACEC.

❖ *High priority would be given to acquiring inholding lands or interests and adjacent lands along Moose Creek on east boundary from willing landowners to enhance management and ACEC values.*

❖ *Area would be classified as not suitable for Recreation and Public Purposes patent actions.*

Land Use Authorizations

❖ *Area would be closed to all new rights-of-way and 2920 Permits and Leases.*

❖ *Area would be classified as not suitable for Recreation and Public Purposes lease actions.*

Leasable Minerals (Oil and Gas)

❖ *Oil and Gas activities would be subject to No Surface Occupancy (would apply if the Humbug Spires WSA were released from wilderness consideration).*

❖ *Area would be unavailable to all other mineral leases.*

Locatable Minerals

- ACEC values would be protected from undue and unnecessary degradation.
- A Plan of Operations would be required for any surface disturbing activity greater than casual use in the ACEC.

Salable Minerals

- The area would be unavailable to salable minerals.

Vegetation Management

❖ *Management activities would be allowed to restore ecosystems provided natural, primitive recreation, native wildlife and scenic values are protected.*

Fire

- BLM would seek opportunities with surrounding landowners (private/FS) to allow natural fires to burn when they are within established prescriptions and beneficial to ACEC values.
- Prescribed fires would only be used in situations that would benefit ACEC values.

Livestock Grazing

❖ *Management would ensure against unauthorized livestock grazing (maintain/build boundary fences, cattle guards and closely monitor livestock trailing).*

- Management activities would only be allowed to protect or enhance ecosystems and ACEC values.

Additional Special Management

❖ *BLM would assess alternatives and implement measures to minimize visitor encounters and enhance solitude experiences along the established hiking trail.*

- *The existing trail would be rerouted/maintained to address erosion and water quality concerns.*
- *Outfitter camping use within 200 feet of existing trail would be eliminated.*
- *Special permit uses would be eliminated during summer holiday weekends if conflicts arise with other public visitors.*
- *BLM would close rock climbing on spires with active raptor nests to outfitter uses and educate the public about the importance of avoiding such locations.*
- *The interpretative information displayed at the Moose Creek Trailhead would be improved to:*
  - *Describe the area and its important/relevant characteristics.*
  - *Educate visitors about resource protection and Leave No Trace principles.*
  - *Display a quality map of the area.*

Elkhorns Potential ACEC

The Elkhorns potential ACEC would be managed as an ACEC in all action alternatives. The size of this potential ACEC would vary by alternative as described for each alternative below. Management direction is characterized by major management activity categories by alternative.

Alternative B – Preferred Alternative

Four potential ACECs would be designated totaling 70,644 acres. These areas are Sleeping Giant (11,679 acres), Elkhorns (50,431 acres), Humbug Spires (8,374 acres), and Ringing Rocks (160 acres). The Elkhorns ACEC would include priority wildlife and primitive recreation lands as a subset of the area described in the interagency MOU as the Elkhorn Mountains Cooperative Wildlife Management Unit boundary (**Map 33**). Therefore the Elkhorns ACEC boundary in Alternative B does not match the area described as the cooperative management unit in the interagency MOU.

Proposed management of Sleeping Giant and Humbug Spires is described in "Management Common to Action Alternatives" above.

Ringing Rocks Potential ACEC (160 acres)

The Ringing Rocks withdrawal was established in 1965. The Montana Bureau of Mining and Geology evaluation concluded that while the greater surrounding area has high mineral potential, the Ringing Rocks withdrawal area has low to no mineral potential.

The Ringing Rocks is a geologic feature resulting from a combination of chemical composition and jointing patterns which chime when struck. Rocks removed from the formation do not ring. The only other ringing rocks formation known in the United States is located in Pennsylvania.

If the Ringing Rocks feature was changed in any way, including mining, it could not be reclaimed to the extent that the rocks would once again ring.

Salable Minerals

- *The area would be unavailable to salable minerals.*

Vegetation Management

- *Vegetation treatments would be planned to ensure that the visual qualities of the 160-acre area are not adversely impacted.*

Additional Special Management

BLM would manage the area as follows.

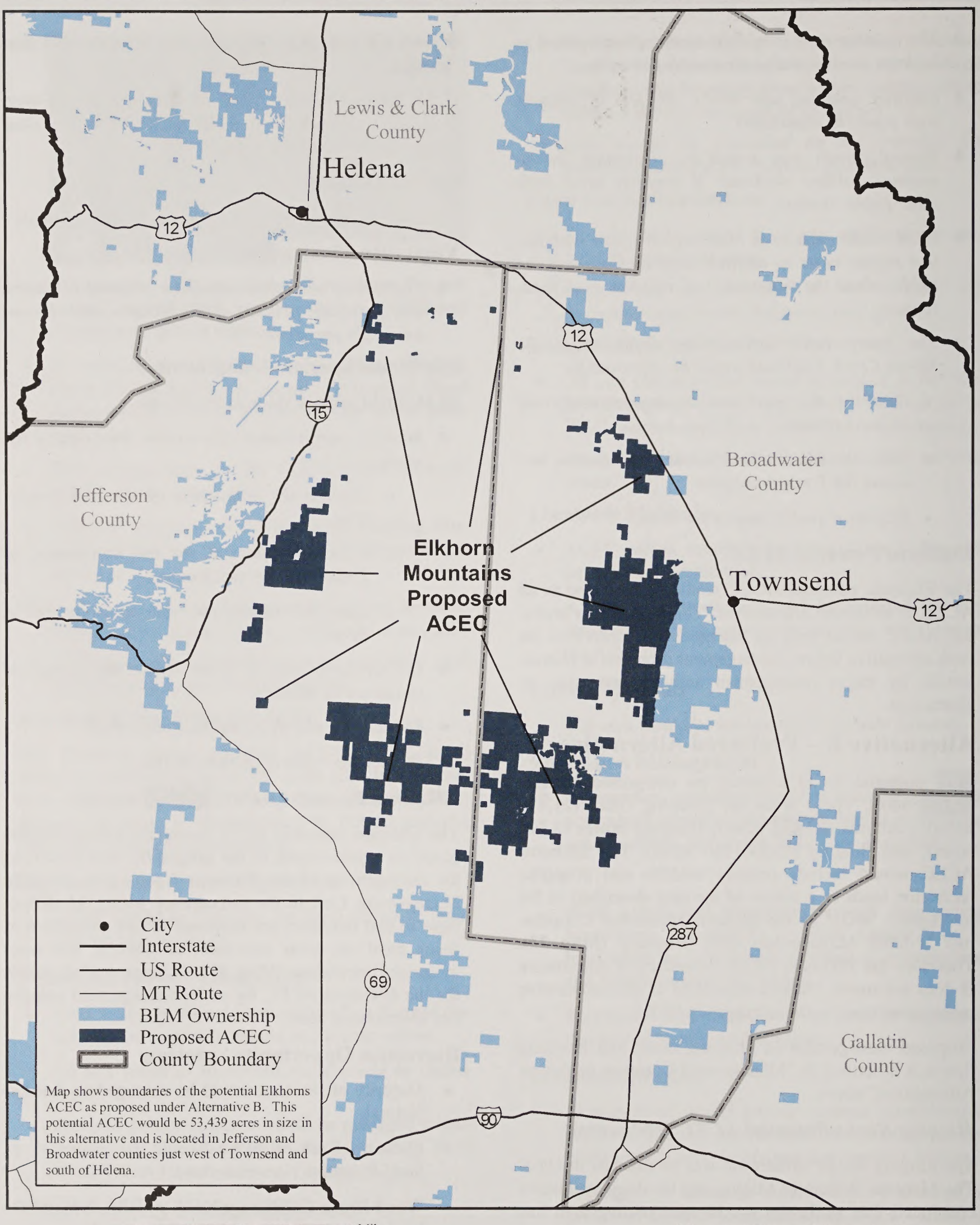
- *Improve interpretative information displayed at the site to:*
  - *Discuss the uniqueness of the rock formation.*
  - *Educate visitors about the importance of protecting the rock features*
  - *Describe the cultural / mining history of the area*
- *Collection/removal of rocks within the formation would not be allowed.*
- *Reclaim the nearby abandoned mine shaft.*
- *Protect any cultural features at risk.*

Elkhorns Potential ACEC (50,431 acres)

The Elkhorns potential ACEC boundary was developed based on modifications to the geographic area described for management of the Elkhorns Cooperative Wildlife Management Unit in the interagency MOU. Modifications to that boundary are proposed in this alternative to focus most on areas important to wildlife and non-motorized recreation (**Map 33**). Management direction for the Elkhorns ACEC by major management categories is described below.

Recreation Opportunity Spectrum

- Majority of the area would be managed as Roaded Natural.
- Elkhorns Tack-on WSA would be managed as Semi-Primitive Non-motorized.
- Wood-Horse Gulch area North of BPA road would be managed as Semi-Primitive Motorized.
- Nursery-Golconda Creek area northwest of WSA would be managed as Semi-Primitive Motorized.
- Parcels between Dutchman and Prickly Pear Creek would be managed as Semi-Primitive Motorized.



Map generated by the Butte Field Office in February 2007

Albers Equal Area, NAD83 Projection

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Map 33: Elkhorn Mountains Proposed Areas of Critical Environmental Concern (ACEC) Under Alternative B

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- Johnny-Keating area would be managed as Roaded Modified.

Motorized Travel Management

- Motorized travel would be "limited" to designated routes in order to protect wildlife and non-motorized recreation values.
- No new permanent roads or motorized trails would be authorized for public use (road relocation would be allowed to protect resources, maintain access and/or protect human safety).
- Existing road closures would be maintained and enforced per the 1995 Elkhorns travel plan. BLM would re-evaluate and/or monitor routes to determine if changes to existing plan are required.

❖ *Non-motorized recreation would be promoted and emphasized.*

Visual Resource Management

- The majority of the area would be managed as VRM Class III and IV.
- The Elkhorns Tack-on WSA would be managed as VRM Class II.
- High visibility lands along Missouri River, canyon cliffs along Indian Creek and scattered parcels adjacent to FS north and west boundaries would be managed as VRM Class II.

Land Ownership/Adjustment

❖ *All BLM lands within the ACEC would be retained in BLM public ownership.*

❖ *Areas would be classified as not suitable for Recreation and Public Purposes patent actions.*

❖ *Priority would be given to acquire lands (fee title/easements) to "block up" BLM lands within and adjacent to the ACEC to enhance relevant and important values, manageability and public access to or within the area.*

Land Use Authorizations

❖ *The ACEC would be open to new rights-of-way and 2920 Permits and Leases with restrictions to protect area values.*

❖ *Area would be classified as not suitable for Recreation and Public Purposes lease actions.*

Leasable Minerals (including Oil and Gas)

- No Surface Occupancy would be allowed in Muskrat Creek Watershed.
- No Surface Occupancy would be allowed in Crow Creek Campground.
- No Surface Occupancy would be allowed in sensitive plant population locations.
- Remaining area would be subject to stipulations for oil and gas exploration for Alternative B.

Locatable Minerals

ACEC lands would be open to operations under the Mining Laws. An approved Plan of Operations would be required for surface disturbing activity greater than casual use.

Salable Minerals

- Salable minerals sales would be allowed in a way that minimizes impacts to wildlife and recreation.

Vegetation Management

❖ *The Elkhorns would be managed as an ecological unit across political boundaries for the purpose of sustaining ecological systems, including the full range of potential biological diversity and ecosystem processes.*

❖ *No timber salvage would be allowed unless beneficial to ACEC values or needed for human safety.*

Wildlife

❖ *Current direction outlined in the Memorandum of Understanding (MOU) signed by MFWP, USFS, and BLM would be followed within a modified boundary from the one described in the MOU.*

- Wildlife and wildlife habitats would be managed to support populations of species associated with endemic vegetative communities, with emphasis on providing the necessary habitat components for those species with special needs.
- Management activities would have long-term benefits to wildlife and would minimize short-term impacts (with the exception of mining).
- The BLM would seek opportunities to convert sheep allotments to cattle allotments at the time an allotment is vacated, sold, or transferred. Existing sheep allotments would remain in effect unless the permittee is interested in working with the BLM to convert to cattle.
- BLM would continue to actively participate in partnerships.

❖ *BLM would continue to work with MFWP and the USFS to resolve issues in the Elkhorn Mountain Range.*

- Activity timing restrictions for burning, noise and ground disturbance would be enforced.

Fire

- BLM would seek opportunities with surrounding landowners (private/FS) to allow natural fires to burn when within established prescriptions.

- BLM would continue following the existing Elkhorns Fire Management Plan but evaluate all opportunities for natural fire use.

Livestock Grazing

- BLM would provide priority management to ensure against unauthorized livestock grazing (maintain/build boundary fences, cattle guards and closely monitor livestock trailing).
- Management activities would be allowed only to maintain or enhance ecosystems, natural qualities, and scenic values.

Cultural

- BLM would refrain from developing any additional roads to prevent further degradation to historic ditches, dams, and reservoirs.

Alternative C

All five potential ACECs would be designated totaling 87,893 acres. These areas are Sleeping Giant (11,679 acres), Elkhorns (67,665 acres), Humbug Spires (8,374 acres), Spokane Creek (14 acres), and Ringing Rocks (160 acres). The Elkhorns ACEC would be enlarged to include all BLM lands within the interagency MOU boundary (**Map 34**).

Management direction for Sleeping Giant and Humbug Spires would be the same as that described in "Management Common to Action Alternatives" above. Management direction for Spokane Creek and Ringing Rocks would be the same as that described for Alternative B.

Elkhorns Potential ACEC (67,665 acres)

The proposed boundary for this ACEC in this alternative incorporates the geographic boundary described in the interagency Elkhorns Wildlife Management Unit MOU. Management direction for the Elkhorns ACEC would be the same as that described for Alternative B with the following variations.

Motorized Travel Management

- Motorized travel would be "Limited" to designated routes in order to protect wildlife and non-motorized recreation values (except for play area near Radersburg).

❖ *Non-motorized recreation would be emphasized and promoted except in the Radersburg play area.*

Wildlife

❖ *The current direction outlined in MOU signed by MFWP, the USFS and the BLM would be followed within the entire boundary around the Elkhorn Mountain Range as described in the MOU.*

Cultural

- BLM would conduct thorough research on the Hassel Canyon flume with the intent of interpreting the structure at some point in the future.

Locatable Minerals

❖ *Approximately 180 acres in riparian areas of the Muskrat and Nursery Creek drainages would be recommended for withdrawal from mineral entry.*

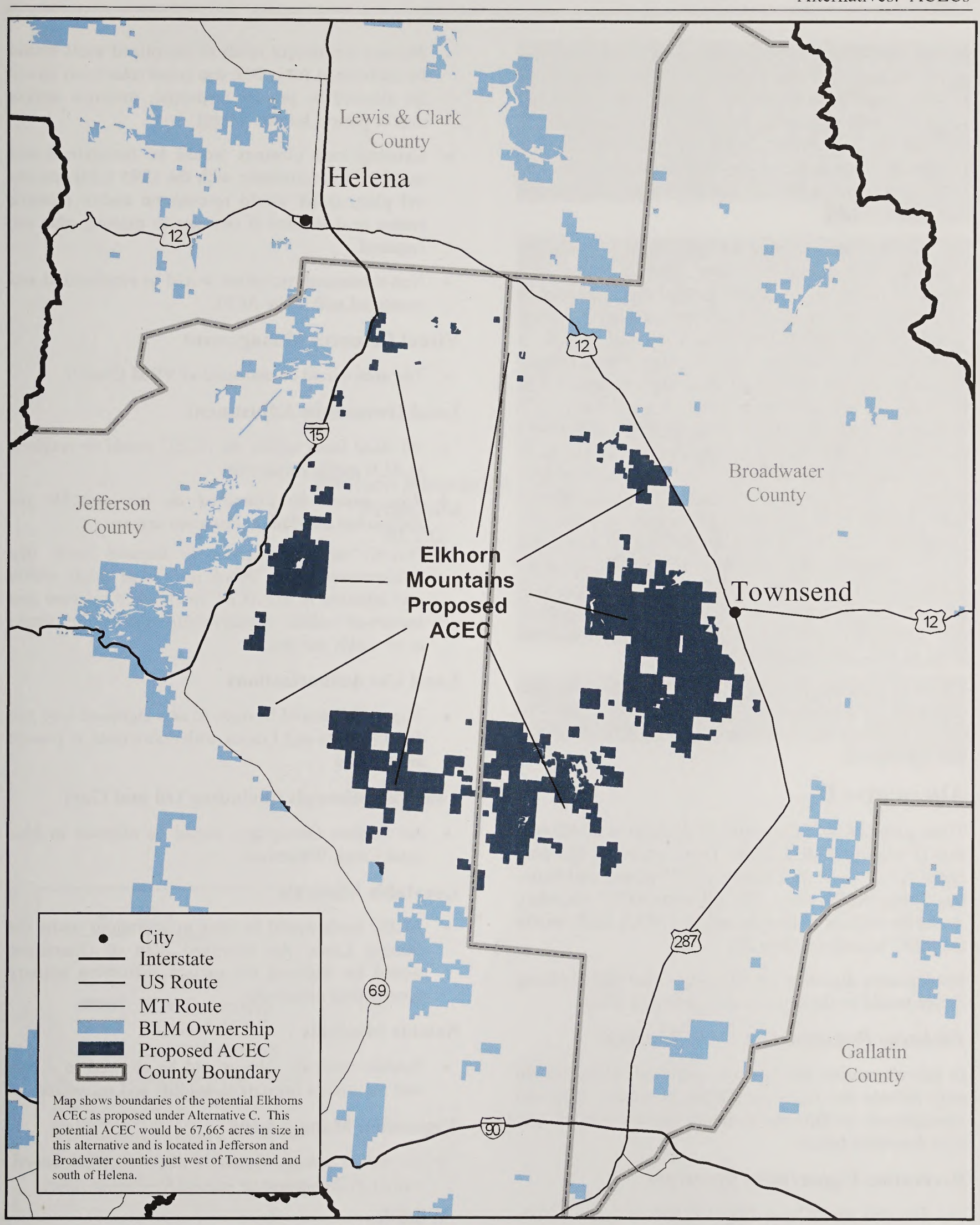
Westslope cutthroat trout have declined in abundance, distribution, and genetic diversity throughout their native range. In the Missouri River drainage of Montana genetically pure westslope cutthroat trout are estimated to persist in less than 5 percent of the habitat they once occupied. To prevent listing under the Endangered Species Act, federal and state managers need to ensure conservation of local populations, preservation of genetic diversity and work towards the long-term, self-sustaining persistence of westslope cutthroat trout (MFWP 1999).

Muskrat Creek has importance to westslope cutthroat trout restoration beyond the local level because after a ten year, $50,000 restoration effort, its population is now used as a donor source to re-establish westslope cutthroat trout in a number of different locations in the State of Montana. Montana Fish, Wildlife and Parks has identified Muskrat Creek as the most secure and having the strongest population of westslope cutthroat trout in the entire Elkhorn Mountain range.

The 180 acres proposed for the Muskrat/Nursery Creek withdrawal would provide the minimum amount of protection to water quality, stream morphology, and riparian function to protect the restored and unique population of westslope cutthroat trout.

This withdrawal would protect the genetically pure westslope cutthroat trout population in Muskrat Creek by preventing loss of riparian vegetation, streambed and bank destabilization, erosion and sedimentation, loss of floodplain vegetation, alteration of floodplain morphology, and alteration of stream channel morphology that could occur in association with locatable mineral activity, particularly placer mining. Another key impact that placer mining (including casual use) could have on westslope cutthroat trout, is excavation, crushing, or disturbance of streambed gravels during the critical period when trout are spawning and eggs are incubating/hatching. If mining operations cause a decline in the population, the population may no longer be able to function as a donor source for Montana and impede restoration efforts."

Muskrat and Nursery Creek are located in the southern Elkhorn WSA which was evaluated in the joint Bureau of Mines and USGS report Mineral Summary Bureau of Land Management Wilderness Study Areas in Montana (1990). In the Muskrat and Nursery Creek areas the report concluded that there is high resource potential for



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Map 34: Elkhorn Mountains Proposed Areas of Critical Environmental Concern (ACEC) Under Alternative C

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copper, molybdenum and tungsten with a certainty level of D (available information clearly defines the level of mineral resource potential, the highest level of confidence), as well as a moderate mineral resource potential for uranium and thorium with a certainty level of C (Available information gives a good indication of the level of resource potential, US DOI Bureau of Mines and USGS, 1990).

No potential for placer mining has been identified in either Muskrat or Nursery Creek; therefore there is a very low probability of any proposals being submitted to the BLM. In the absence of a mineral withdrawal, should a miner propose to conduct placer mining in these drainages, timing stipulations could be attached to the permit to protect critical periods of spawning and incubation/hatching. Should lode mining be proposed for any of resources identified in the Bureau of Mines report mining practices, BMPs, reclamation/rehabilitation techniques, and bonding would be applied. If unavoidable impacts were to occur they would be mitigated through restoration at the conclusion of mining to the extent practicable. In spite of these measures, minerals operations that substantially reduce the size of the westslope cutthroat trout population and/or have long-term substantial adverse effects on aquatic habitat could eliminate the ability to use this fish population as a donor source to re-establish other populations.

The remaining ACEC lands would be open to operations under the Mining Laws. An approved Plan of Operations would be required for surface disturbing activity greater than casual use.

Alternative D

Three potential ACECs would be designated in Alternative D totaling 23,628 acres. These areas are Sleeping Giant (11,679 acres), Elkhorns (3,575 acres), and Humbug Spires (8,374 acres). The Elkhorns ACEC boundary would be reduced to include only the WSA lands within the MOU boundary (**Map 35**).

Management direction for Sleeping Giant and Humbug Spires would be the same as that described above.

Elkhorns Potential ACEC (3,575 acres)

In this alternative the Elkhorns potential ACEC would only include the 3,575 acre WSA boundary. Proposed management for this area by major management category is described below.

Recreation Opportunity Spectrum

- The area would be managed as Semi-Primitive Non-motorized.

Motorized Travel Management

- Motorized travel would be "limited" to designated routes in order to protect wildlife and non-motorized recreation values.
- No new permanent roads or motorized trails would be authorized for public use (road relocation would be allowed to protect resources, maintain access and/or protect human safety).
- Existing road closures would be maintained and enforced in accordance with the 1995 Elkhorns travel plan. BLM would re-evaluate and/or monitor routes to determine if changes to existing plan are required.
- Non-motorized recreation would be emphasized and promoted within the ACEC.

Visual Resource Management

- The area would be managed as VRM Class II.

Land Ownership/Adjustment

- ❖ *All BLM lands within the ACEC would be retained in BLM public ownership.*
- ❖ *Area would be classified as not suitable for Recreation and Public Purposes actions.*
- ❖ *Priority would be given to acquire lands (fee title/easements) to "block up" BLM lands within and adjacent to the ACEC to enhance relevant and important values, manageability and public access to or within the area.*

Land Use Authorizations

- The ACEC would be open to new rights-of-way and 2920 Permits and Leases with restrictions to protect area values.

Leasable Minerals (including Oil and Gas)

- No Surface Occupancy would be allowed in Muskrat Creek Watershed.

Locatable Minerals

- ACEC lands would be open to operations under the Mining Laws. An approved Plan of Operations would be required for surface disturbing activity greater than casual use.

Salable Minerals

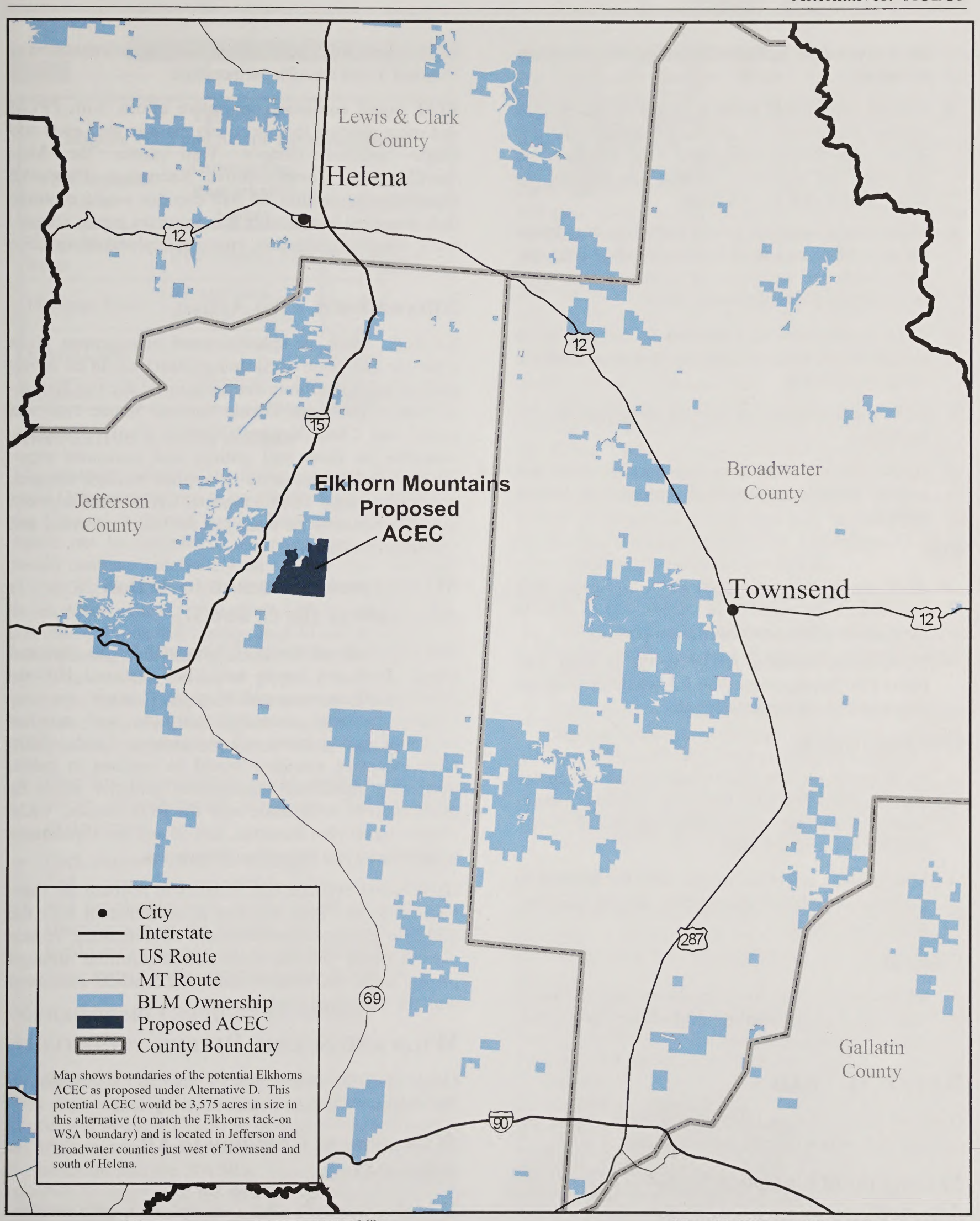
- Salable minerals sales would be allowed in a way that minimizes impacts to wildlife and recreation.

Vegetation Management

- ❖ *No timber salvage would be allowed unless beneficial to ACEC values or needed for human safety.*

Wildlife

- ❖ *The current direction outlined in MOU signed by MFWP, the USFS and the BLM would be followed within the existing WSA boundary.*
- The Muskrat and Nursery Creek drainages would be managed as an ecological unit for the purpose of sustaining ecological systems, including the full



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Map 35: Elkhorn Mountains Proposed Areas of Critical Environmental Concern (ACEC) Under Alternative D

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range of potential biological diversity and ecosystem processes.

❖ *Wildlife and wildlife habitats would be managed to support populations of species associated with endemic vegetative communities, with emphasis on providing the necessary habitat components for those species with special needs.*

- Management activities would have long-term benefits to wildlife and would minimize short-term impacts (with the exception of mining where long-term impacts could potentially occur).
- BLM would seek opportunities to convert sheep allotments to cattle allotments to protect bighorn sheep populations.
- BLM would continue to actively participate in partnerships.
- Activity timing restrictions with burning, noise and ground disturbance would be enforced to protect wildlife.

Fire

❖ *BLM would seek opportunities with surrounding landowners (private/FS) to allow natural fires to burn when within established prescriptions.*

- BLM would continue following the existing Elkhorns Fire Management Plan but would evaluate all opportunities for natural fire use.

Livestock Grazing

- BLM would provide priority management to ensure against unauthorized livestock grazing (maintain/build boundary fences, cattle guards and closely monitor livestock trailing).
- Management activities would only be allowed to maintain or enhance ecosystems, natural qualities, and scenic values.

Cultural

- BLM would refrain from developing any additional roads to prevent further degradation to historic ditches, dams, and reservoirs.

National Trails

Goal – Manage National Trails to promote public enjoyment and protect their designated values.

Management Common to All Alternatives

The Continental Divide Trail would be managed cooperatively with the USFS in accordance with national policy guidelines. The Lewis and Clark Historic Trail would be managed cooperatively with the National Park Service (NPS) in accordance with national policy guidelines.

BLM would seek opportunities to cooperatively manage National Trails through partnerships.

BLM would continue cooperative efforts with PPLM and other partners to collectively manage the Lewis and Clark National Historic Trail under the Missouri/Madison Comprehensive Recreation Plan. All recreation sites within the trail corridor would continue to be managed in a manner that promotes public accessibility, resource protection, visitor safety, and interpretive education.

Alternative A – No Action

No ROS, VRM, or specific travel management plans (with the exception of Sleeping Giant) would be developed to guide the future management of the two National Trails (Continental Divide National Scenic Trail and Lewis and Clark National Historic Trail). Protective measures for these trail settings and associated experiences would continue to be applied through resource use project plans. The Continental Divide Trail segment would continue to be managed for both motorized and non-motorized uses.

Management Common to Action Alternatives (B, C, and D)

The two National Trails (Continental Divide National Scenic Trail and Lewis and Clark National Historic Trail) would be managed to protect natural resource values, minimize recreation conflicts, and enhance recreation opportunities and experiences. Lands within these extensive corridors would be retained in public ownership. Additional management guidance would be established in accordance with the ROS classes, VRM classes, travel plan direction, and oil and gas stipulations established under the action alternatives.

BLM would evaluate opportunities to re-route the Continental Divide Trail segment in coordination with the USFS to enhance non-motorized opportunities; reduce current needs for use easements/acquisitions through private lands; and remove motorized conflicts associated with the motorized road.

Wild and Scenic Rivers

Goal – Identify river segments suitable for inclusion in the National Wild and Scenic River System.

Management Common to All Alternatives

In cooperation with other agencies, local governments, and special interest groups, management would be conducted in a manner to protect and enhance the outstandingly remarkable values for each suitable river segment. **Table 2-19** depicts the outstanding remarkable values and tentative classifications of the four eligible Wild and Scenic River segments. Additional information

is provided in **Appendix J – National Wild and Scenic Rivers.**

Table 2-19
Eligible Wild and Scenic River Segments

WSR Segment Name	Outstanding Remarkable Values	Tentative Classification
Upper Big Hole River	Recreational, Fish	Recreational
Missouri River	Recreational, Wildlife, Scenic	Scenic
Moose Creek	Recreational, Scenic	Scenic
Muskrat Creek	Fish	Scenic

Alternative A – No Action

The suitability study of the four river segements in the Field Office determined to be eligible for designation in the National Wild and Scenic River System (**Map 36**) would not be completed and protective management would continue indefinitely on all four river segments (Upper Big Hole River - 2.3 miles, Missouri River – 3.1 miles, Moose Creek – 4.0 miles, and Muskrat Creek – 2.6 miles). Protective management would be subject to valid existing rights and to actions within BLM's authority. A case-by-case review of proposed activities would be completed to ensure that Wild and Scenic River eligibility and tentative classification would not be affected. Protective management objectives would include:

- Free-flow characteristics would not be modified by stream impoundments, diversions, channelization, or riprapping.
- Each segment would be managed to protect identified outstandingly remarkable values, and to the extent practicable such values would be enhanced. Development of the eligible river and its corridor would not be modified to the extent that the eligibility or tentative classification would be affected.

Management Common to Action Alternatives

Suitability studies were conducted for the four eligible river segments (Big Hole River, Missouri River, Moose Creek, and Muskrat Creek) to determine whether any or all of these areas should be recommended to Congress for inclusion into the NWSRS. These suitability recommendations vary under the three action alternatives. See **Appendix J** for additional information about these areas and the study process.

Alternative B - Preferred Alternative

Under Alternative B, Muskrat Creek (2.6 miles) would be recommended as suitable for inclusion in the National Wild and Scenic Rivers System (NWSRS). Missouri River (3.1 miles) would be found preliminarily suitable, but would only be recommended for inclusion in the NWSRS pending USFS (Helena National Forest) concurrence and coordination. This river segment is bordered by BLM lands on one side and Helena National Forest lands on the other. A joint recommendation by BLM and the USFS would be necessary to forward the Missouri River segment as suitable for inclusion in the NWSRS. The Upper Big Hole River and Moose Creek would be identified as non-suitable for inclusion.

The following protective management under the Wild and Scenic Rivers Act would be applied to Muskrat Creek until it is either designated by Congress or released to multiple use. This management would also be applied to the Missouri River until the possibility of recommending it for NWSRS designation is resolved with the USFS. The direction would continue to apply if the Forest Service supports recommending a designation. Protective management would be subject to valid existing rights and to actions within BLM's authority. A review of proposed activities would be completed to ensure that Wild and Scenic River eligibility and tentative classification would not be affected.

Protective management objectives would include:

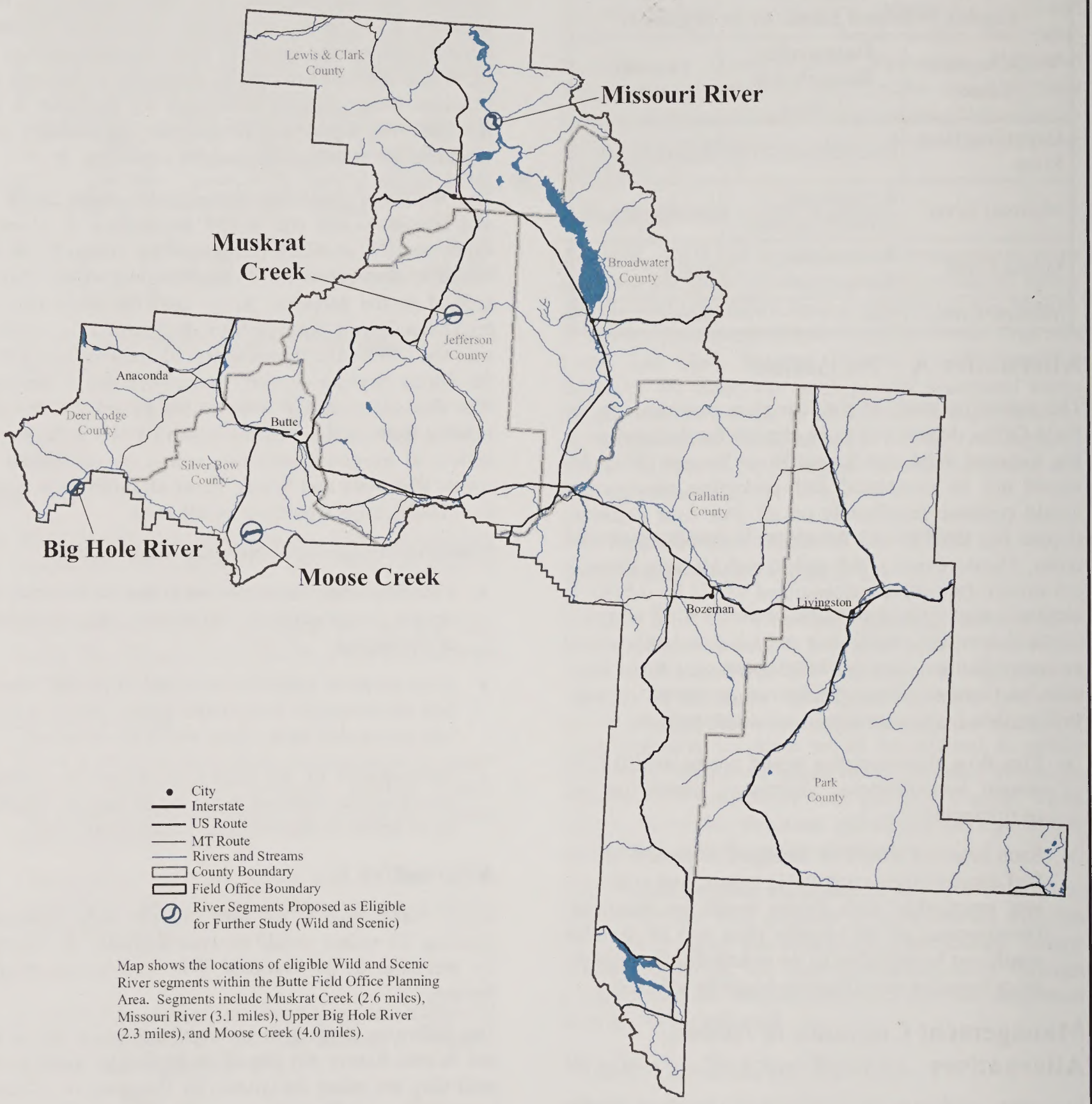
- Free-flow characteristics would not be modified by stream impoundments, diversions, channelization, or riprapping.
- Each segment would be managed to protect identified outstandingly remarkable values, and to the extent practicable such values would be enhanced.
- Development of the eligible river and its corridor would not be modified to the extent that the eligibility or tentative classification would be affected.

Alternative C

Under Alternative C all four eligible river segments (totaling 12 miles) would be recommended as suitable for inclusion in the National Wild and Scenic Rivers System.

The following protective management under the Wild and Scenic Rivers Act would be applied to these rivers until they are either designated by Congress or released to multiple use. Protective management would be subject to valid existing rights and to actions within BLM's authority. A case-by-case review of proposed activities would be completed to ensure that Wild and Scenic River eligibility and tentative classification would not be affected. Protective management objectives include:

- Free-flow characteristics would not be modified by stream impoundments, diversions, channelization, or riprapping.
- Each segment would be managed to protect identified outstandingly remarkable values, and to the extent practicable such values would be enhanced.



Map shows the locations of eligible Wild and Scenic River segments within the Butte Field Office Planning Area. Segments include Muskrat Creek (2.6 miles), Missouri River (3.1 miles), Upper Big Hole River (2.3 miles), and Moose Creek (4.0 miles).

0 40 Miles

Map Scale 1:1,500,000

Map generated by the Butte Field Office in February 2007

Albers Equal Area, NAD83 Projection

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Map 36: National Wild and Scenic River System Eligible Segments

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Development of the eligible river and its corridor would not be modified to the extent that the eligibility or tentative classification would be affected.

Alternative D

Under Alternative D all four of the eligible river segments would be identified as non-suitable for inclusion in the National Wild and Scenic River System. These river segments and their associated corridors would be managed in accordance with the prescriptions described throughout Alternative D rather than under the protective management objectives for eligible or suitable rivers.

Wilderness Study Areas

Goal – Manage Wilderness Study Areas (WSAs) to maintain their suitability for potential wilderness designation.

Management Common to All Alternatives

All BLM lands were evaluated to determine whether additional lands other than existing WSAs have wilderness characteristics (blocks of land at least 5,000 acres in size with naturalness and opportunities for primitive and unconfined recreation). Lands obtained through acquisitions since previous wilderness reviews were considered in concert with pre-existing BLM lands. No additional BLM lands were identified as having wilderness characteristics because no areas with naturalness and opportunities for primitive and unconfined recreation met the size criteria.

All six WSAs (Humbug Spires – 11,320 acres, Sleeping Giant – 6,666 acres, Sheep Creek – 3,801 acres, Black Sage – 5,917 acres, Elkhorn Tack-on – 3,575 acres, and Yellowstone River Island – 69acres) would continue to be managed under the Interim Management Policy and Guidelines for Lands under Wilderness Review (BLM Handbook H-8550-1 dated 1995) until such time as Congress either designates them as wilderness or releases them from further consideration as wilderness. The wilderness characteristics (naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined recreation) of each of the six WSAs would continue to be protected under the IMP directives.

Those areas designated wilderness by Congress would be managed per the Wilderness Act of 1964, as amended, Public Law 88-577 (16 United States Code 1131-1136). In addition, an area-specific wilderness management plan would be developed.

WSAs would continue to be managed in accordance with the established monitoring and sign plans for each WSA.

In addition to the Interim Management Protection mandates, both the Sleeping Giant and the Sheep Creek WSAs would continue to be managed as part of the Sleeping Giant ACEC and management plan written in 1988.

Alternative A – No Action

All six WSAs would continue to be managed under the Interim Management Policy and Guidelines. This alternative assumes that no Congressional action would occur to designate or release these WSAs.

All areas are under consideration by Congress. Portions of Humbug Spires, all of Sleeping Giant, and all of Sheep Creek were recommended to Congress as suitable for wilderness designation. The Black Sage and Yellowstone River Island Wilderness Study Areas were recommended by BLM as unsuitable. The Elkhorn Tack-on WSA has not been studied for wilderness suitability, and its existence under the wilderness review process is dependent upon the adjoining USFS lands which are under wilderness review. BLM would complete a suitability study for this WSA if the FS recommends its adjacent lands for wilderness through its Land Use Plan. No recommendation currently exists.

Management Common to Action Alternatives (B, C, and D)

WSAs released from further consideration as wilderness would be managed consistent with surrounding lands and prescriptions identified in the land use plan alternatives. Release management is described for each WSA in the specific alternative descriptions below.

Under all action alternatives the Sleeping Giant, Sheep Creek, Humbug Spires, and Elkhorns Tack-on WSAs would be managed as ACECs. These administrative designations would promote continued protection of the existing wilderness characteristics for these four areas.

In the event that WSAs designated as ACECs become designated as wilderness, ACEC management would be dropped upon development of wilderness management plans. See ACEC section for detailed descriptions of proposed ACEC management of these areas.

Should the FS lands adjacent to the Elkhorns Tack-on be removed from wilderness review, this Section 202 (FLPMA) WSA would be dropped from further wilderness consideration. This small WSA is not capable of providing outstanding opportunities for solitude or primitive and unconfined recreation on its own.

Protection of the wilderness characteristics for Black Sage and the Yellowstone River WSAs varies under each of the action alternatives.

Alternative B – Preferred Alternative

The Black Sage and Yellowstone River Island WSAs would continue to be managed under the Interim Man-

agement Policy Guidance for WSAs. In the event that Congress releases these two areas from wilderness consideration, these areas would be managed as described below for Alternative B.

Black Sage – MT-075-115

The Black Sage WSA would continue to be managed to provide semi-primitive, motorized recreation opportunities. Motorized travel within the area would be limited and the availability of established routes would be determined through an area-specific travel management plan. New permanent roads would not be authorized although re-routes may be considered to minimize resource impacts, public safety issues, or access concerns. The visual resource classification of the area would be modified from VRM Class I to VRM Class II management.

Land ownership would be managed for retention and exchanges would be considered to improve its configuration and manageability. The area would be open to rights-of-way subject to mitigations. Management would emphasize restoration and maintenance of natural processes and conditions when considering the appropriateness of other resource uses. Locatable minerals would be open and subject to undue or unnecessary degradation as per discussion below for the island. All salable and leasable minerals with the exception of oil and gas would remain unavailable. Oil and gas development would be subject to Field Office wide stipulations developed for Alternative B. All other resources and uses would be managed in accordance with Alternative B management direction.

Yellowstone River Island – MT-075-133

The Yellowstone Island would continue to be managed to provide semi-primitive, non-motorized recreation opportunities. The island would remain closed to motorized travel. The visual resource classification of the area would be modified from VRM Class I to VRM Class II management. Land ownership would be managed for retention and would be closed to rights-of-way.

The island would be open to locatable mineral entry subject to requirements to prevent unnecessary and undue degradation. Oil and gas development activities would be subject to stipulations described Field Office wide for Alternative B. This area would be closed to all other leasable and salable mineral actions. Livestock grazing and forest management practices would not be allowed. All other resources and uses would be managed in accordance with Alternative B management direction.

Alternative C

The Black Sage and Yellowstone River Island WSAs would continue to be managed under the Interim Management Policy Guidance for WSAs. In the event that Congress releases these two areas from wilderness consideration, these areas would be managed as described below for Alternative C.

Black Sage – MT-075-115

Management would be the same as described under Alternative B for ROS, motorized travel, VRM, land ownership, and salable and leasable minerals other than oil and gas. Oil and gas stipulations described Field-Office wide for Alternative C would apply. All other resources and uses would be managed in accordance with Alternative C management direction.

Yellowstone River Island – MT-075-133

Management would be the same as described under Alternative B for ROS, motorized travel, VRM, land ownership, rights-of-ways, minerals, livestock grazing and forest management. Oil and gas development activities would be subject to stipulations described Field Office wide for Alternative C. All other resources and uses would be managed in accordance with Alternative C management direction.

Alternative D

The Black Sage and Yellowstone River Island WSAs would continue to be managed under the Interim Management Policy Guidance for WSAs. In the event that Congress releases these two areas from wilderness consideration, management of these areas is described below for Alternative D.

Black Sage – MT-075-115

The area would be open to salable and leasable minerals including oil and gas. Oil and gas development activities would be subject to stipulations described Field Office wide for Alternative D. Management would be the same as described under Alternative B for ROS, motorized travel, VRM, land ownership, and rights-of-way. All other resources and uses would be managed in accordance with Alternative D management direction.

Yellowstone River Island – MT-075-133

The island would be available for land adjustment, and salable and leasable minerals. Oil and gas development activities would be subject to stipulations described Field Office wide for Alternative D. Management would be the same as described under Alternative B for ROS, motorized travel, VRM, rights-of-way, locatable minerals, oil and gas, livestock grazing and forest management. All other resources and uses would be managed in accordance with Alternative D direction.

MANAGEMENT CONCERNS

Air Quality

Goal – Ensure BLM authorizations and management activities protect the local quality of life and sustain economic benefits by complying with tribal, local, state,

and federal air quality regulations, requirements and implementation plans.

Management Common to All Alternatives

BLM would continue to participate in local, state, and federal ambient air quality monitoring programs, as required. Management of non-attainment areas within the Planning Area would be guided by the state.

BLM would comply with local, state, and federal regulatory requirements.

All resource uses would meet the Land Health Standards for air quality.

Management would minimize or prevent air quality degradation throughout the Planning Area by applying mitigation measures to projects.

Air resources would continue to be evaluated on a case-by-case basis as part of project level planning to ensure compliance with local, state, and federal regulatory requirements. Evaluations would consider the significance of the proposed project and the sensitivity of air resources in the affected area. Mitigation measures would be developed as appropriate to ensure compatibility of projects with air resource management.

Before approval of an application for permit to drill (APD) for oil and gas or a Sundry Notice application that would involve surface disturbance, the appropriate level of NEPA analysis (in most cases an EA) would be completed. This document would analyze effects on all appropriate resources and resource uses including air quality as identified.

Soil Resources

Goal 1 – Manage uses to minimize accelerated soil erosion and compaction and maintain surface soil water infiltration based on site-specific conditions.

Goal 2 – Maintain or improve soil health and fertility, prevent or minimize erosion and compaction while supporting multiple use management.

Management Common to All Alternatives

Soil management objectives would include:

- Reduce soil erosion associated with steeper slopes, granitic soils, and high recreational use areas.
- Reduce sediment delivery to creeks and streams.
- Reduce soil mass movement (primarily from accelerated water erosion) resulting from burned areas, aboveground disturbances (primarily roads), and accelerated streambank erosion.

BLM would continue to implement soil conservation and BMPs to meet these management objectives. Examples of BMPs that would be applied throughout the BFO include:

- Seasonal or yearlong closures of specific road and trail sections to reduce soil erosion.
- Design, enhancement, and maintenance of vegetated filter strips along critical waterways.
- Integration of soil, groundwater, and surface water management to minimize stream channel degradation and improve groundwater and surface water quality.

Soil conservation practices and soil BMPs would provide the basis for maintaining soil productivity, fertility, and stability, and maximizing infiltration of natural precipitation and minimizing runoff, soil erosion, and sedimentation.

Consideration of soil conditions and types and their influence on management actions would occur on a case-by-case basis. Best Management Practices and mitigation measures would be implemented at the site-specific project level to maintain or improve the soil resource. Soils susceptible to compaction and erosion would receive greater consideration when assessing proposed activities.

Soil compaction and erosion problems would be diagnosed using Land Health Standards.

Appropriate mitigation or seasonal restrictions would be applied to activities in areas with significant soil compaction or accelerated erosion.

Management Common to Action Alternatives (B, C, and D)

BLM would reseed disturbed areas where needed.

Water Resources

Goal 1 – Restore and/or maintain the chemical, physical, and biological integrity of water resources to protect designated beneficial uses and achieve water quality standards.

Goal 2 – Maintain existing or acquire new water rights land in the Decision Area to ensure water availability for multiple-use management.

Goal 3 – Minimize erosion and subsequent sedimentation for improved stream and watershed health.

Goal 4 – Maintain or improve morphological conditions to a stable state that can fully support beneficial uses.

Goal 5 – Protect water quality for municipal, industrial, agricultural, recreation, and residential purposes by adopting protective measures to meet tribal, state, and local water quality requirements.

Management Common to All Alternatives

Management would seek to prevent water quality degradation, and improve watershed function throughout the Planning Area.

The objective on Decision Area lands would be for water bodies to have measurable attributes within site-specifically appropriate ranges (including meeting state, tribal, and local water quality standards). From a morphological standpoint these ranges may be based on reference conditions or other scientifically accepted methods. For proper functioning condition in streams, entrenchment, width/depth ratio, sinuosity, channel substrate, and slope should be within the ranges identified for channel types.

The Land Health Standards would be implemented to ensure water quality meets state standards and beneficial uses are protected or restored. BMPs would be used to prevent non-point source water pollution and mitigation measures would be applied on a case-by-case basis. Permits pertaining to projects affecting water quality, wetlands, or streams would be obtained, and outside applicants would be required to provide copies of pertinent permits prior to BLM authorization.

BLM would continue to coordinate and cooperate with Montana Department of Environmental Quality (MDEQ) and communities in the development of Water Quality Restoration Plans and Source Water Protection Plans.

BLM would use the State of Montana BMPs to address non-point source water pollution (**Appendix E – BMPs**).

BLM would comply with the non-degradation provisions of the Montana Water Quality Act.

Projects would be reviewed on a case-by-case basis to minimize impacts to water quality. BLM would use "reasonable land, soil, and water conservation practices" to prevent harm to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other wildlife prior to the adoption of a water quality restoration and TMDL plans.

Water rights and instream flow reservations would be maintained subject to Montana water law. BLM would participate in the Montana Statewide water adjudication process and comply with Montana law for water rights.

Alternative A – No Action

There is no additional management in this alternative beyond that described above in "Management Common to All Alternatives."

Management Common to Action Alternatives (B, C, and D)

Existing water rights would be maintained to ensure water availability for multiple-use management and proper functioning riparian and upland areas.

Water quality would be monitored to establish baseline conditions, identify areas of concern, and document progress from mitigation measures.

BLM would participate in the development, implementation and monitoring of water quality restoration plans and TMDL plans in watershed Planning Areas in which BLM is a significant land manager or water user.

Alternative B – Preferred Alternative

BLM would examine "Water Quality Restoration Plans" (Plans) to determine if reduction targets of pollutants (TMDLs) are reasonable and attainable. Plans would be implemented as funding becomes available.

BLM would consider acquiring water rights from willing sellers.

Burned areas would be monitored for weed infestations and accelerated soil erosion. Where sedimentation impacts adjacent streams, erosion would be remediated.

Alternative C

BLM would reduce pollutants in streams to levels indicated in "Water Quality Restoration Plans." Plans would be implemented as funding becomes available.

BLM would consider acquiring water rights from willing sellers.

Burned areas would be monitored for weed infestations and accelerated soil erosion. Accelerated soil erosion and sedimentation in burned areas would be remediated.

Alternative D

BLM would continue present levels of stream restoration activities. Progress of past actions to improve water quality would be monitored.

Visual Resources

Goal 1 – Manage visual resources in accordance with VRM classifications described in **Appendix C – VRM**.

Management Common to All Alternatives

Under all alternatives, visual resources would be managed according to established guidelines for VRM classes as described in **Appendix C – VRM**.

Visual resource design techniques and best management practices would be used to minimize short and long-term visual impacts.

Contrast ratings would be completed for proposed projects in Class I and II areas, and for proposed projects in Class III and IV that are high impact projects or located in highly sensitive areas.

VRM Class I objectives for all WSAs would be maintained.

Alternative A – No Action

Visual resources would continue to be evaluated as part of activity and project planning. Such evaluation considers the significance of the proposed project and the visual sensitivity of the affected area. Mitigation measures would be attached as appropriate to assure compatibility of projects with management objectives for visual resources.

Under the continuation of current management, visual resources in the Decision Area would be managed as follows:

Approximately 31,500 acres, including the six WSAs, would be managed as VRM Class I.

All lands along the Yellowstone River, Missouri River (Upper Holter Lake to Spokane Hills), Upper Big Hole River Corridor (0.5 miles from each bank) and the Sleeping Giant ACEC totaling about 25,400 acres, would continue to be managed as VRM Class II.

All remaining lands totaling about 250,400 acres would be managed as VRM Class III and IV. This acreage increased since release of the Draft RMP due largely to the recent acquisition of the Iron Mask property near Townsend. These areas would continue to be evaluated and protected on a case-by-case basis through project/activity plans.

Management Common to Action Alternatives

Management classifications would be established for all BLM lands based on visual resource characteristics (scenic quality, sensitivity level and distance zones) and management considerations. Generally, areas that have lower VRM classifications have higher visual resource values and protection measures. (Note: Under all action alternatives, 5,300 acres have been added to the VRM Class II category between the Draft RMP and the Proposed RMP. These acres are predominantly newly acquired lands in the Iron Mask acquisition near Townsend.)

Alternative B - Preferred Alternative

Under Alternative B, the majority of lands in the Decision Area would be managed under VRM Class III. VRM Class II would be increased by 18,200 acres while VRM Classes III and IV would be decreased accordingly as compared to Alternative A. Under Alternative B, objectives for visual resources would be to manage Decision area lands in accordance with the following acreages by VRM classes:

- Approximately 31,500 acres would be managed as VRM Class I. These lands include all six WSAs.
- Approximately 48,900 acres would be managed as VRM Class II.
- Approximately 125,200 acres would be managed as VRM Class III.
- Approximately 101,700 acres would be managed as VRM Class IV.

Map 37 depicts the location of these classes throughout the Decision Area.

Alternative C

Under Alternative C, objectives for visual resources would be to manage Decision Area lands as follows:

- Approximately 31,500 acres would be managed as VRM Class I, including all WSAs.
- Approximately 67,600 acres would be managed as VRM Class II.
- Approximately 151,700 acres would be managed as VRM Class III.
- Approximately 56,500 acres would be managed as VRM Class IV.

Map 38 depicts the location of these classes throughout the Decision Area. This alternative promotes additional protection of visual resources and therefore has the highest acreages proposed under VRM Classes I and II.

Alternative D

Lands managed under VRM Class IV would increase in comparison to Alternatives B and C, but would still be less than under Alternative A, while VRM Classes II and III would decrease slightly.

Under Alternative D, objectives for visual resources would be to manage Decision Area lands as follows:

- Approximately 31,500 acres would be managed as VRM Class I, including all WSAs.
- Approximately 6,600 acres would be managed as VRM Class II.
- Approximately 142,900 acres would be managed as VRM Class III.
- Approximately 126,300 acres would be managed as VRM Class IV.

This alternative has the highest acres proposed under Classes III and IV. **Map 39** depicts the location of these classes throughout the Decision Area.

Cultural Resources, Traditional Cultural Properties and Paleontological Resources

Goal 1 – Identify cultural resource sites, traditional cultural properties, and paleontological localities and mitigate impacts from natural or human-caused deterioration.

Goal 2 – Preserve and protect eligible cultural resource sites, traditional cultural properties, and paleontological localities to ensure that they are available for appropriate uses by present and future generations.

Management Common to All Alternatives

Cultural Resources and Traditional Cultural Properties

At the project level, the BLM would conduct inventories for the purpose of gathering resource information, as per Section 106 of the National Historic Preservation Act, in order to avoid disturbance to cultural resources in the Area of Potential Effect (APE). The BFO would continue Section 106 compliance by working through the State Protocol Agreement with the Montana State Historic Preservation Office. BLM would continue to make determinations of eligibility or non-eligibility for historic properties on land it manages and document all inventories and decisions effecting cultural resources in an annual report. If the project cannot be redesigned to avoid disturbance, the sites would be evaluated for their eligibility for listing on the National Register for Historic Places. If eligible sites cannot be avoided, the BLM would, in consultation with the Montana State Historic Preservation Office, facilitate mitigation to recover data that would otherwise be lost. The BLM would also conduct inventories to gather information about cultural resources, as per Section 110 of the National Historic Preservation Act.

BLM's consultation process for historic mining sites would continue in accordance with the Historic Placer and Lode Mining Properties Programmatic Agreement that among other things specifies creation of a historic preservation plan to organize and compile what is known about various historic mining districts.

BLM would continue to work with Native American tribal governments and their representatives, as well as those members who are recognized cultural leaders, elders, and Tribal Historic Preservation Officers. In addition to cultural resource specialists, the BLM would include other tribal resource specialists who may have an interest in project planning and management issues. Tribal consultation would be most frequent with those entities who historically occupied the Planning Area. Meeting with tribal representatives would be conducted at least once a year to coordinate consultation requirements and to maintain a good working relationship.

All recorded sites would be assigned a use category to facilitate management of those cultural resources. See Definitions of Use Categories in **Appendix K – Cultural Resources**, section .42, A-F.

Paleontological Resources

Fossil localities would be afforded the same consideration as historic sites in project planning, and if localities are in the Area of Potential Effect, then projects would be redesigned where feasible in accordance with FLPMA and BLM Manual Section 8270 (USDI-BLM 1998). If projects cannot be redesigned to avoid fossil localities, then specimens would be excavated by permitted paleontologists. Assistance from permitted institutions and/or individuals would be routinely sought in order to properly map and record fossil localities.

Opportunities for public outreach and education would be pursued as staffing and funding resources permit.

Alternative A – No Action

Cultural Resources and Traditional Cultural Properties

BLM would continue a dedicated program to inventory 100 acres per year to meet obligations under Section 110 of the National Historic Preservation Act.

BLM would continue to provide public outreach and interpretive information on Montana prehistory and history at developed areas, and recreational and interpretive opportunities at significant historic sites with easy access to the public.

Paleontological Resources

At the project level, BLM would continue to map fossil localities so as to avoid those localities during project implementation. If the locality cannot be avoided, permitted institutions or individuals would be contacted to properly map, record, and/or recover, if necessary, paleontological resources. Public education and outreach would be conducted as time and funding permit.

Management Common to Action Alternatives

During the oil and gas leasing process, the following stipulation IM 2005-003 will be attached to lease parcel review documents: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM would not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA

and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Alternative B – Preferred Alternative

Cultural Resources and Traditional Cultural Properties

As an inventory objective, BLM would identify areas with a high potential for various archeological/historical site types, and conduct 200 acres of proactive inventory in those areas each year. One hundred acres of low potential areas would be inventoried each year for comparison.

Educational and public outreach programs on cultural resources would be provided as requested.

Eligible historic buildings would be maintained consistent with National Park Service standards as funding permits. Deteriorating cultural resources falling under the Experimental or Scientific Use Categories eligible for listing on the National Register of Historic Places would be mitigated by intensive recordation or data recovery.

Paleontological Resources

Direction for managing paleontological resources would be the same as Alternative A.

Alternative C

Cultural Resources and Traditional Cultural Properties

As an inventory objective, BLM would identify areas with a high potential for various archeological/historical site types, and conduct 1,000 acres of proactive inventory in those areas. Three hundred acres of low potential areas would be inventoried each year for comparison.

Educational and public outreach programs would be provided for cultural and paleontological resources.

BLM would develop volunteer agreements with local universities and interest groups to sponsor research and assist with fieldwork and maintenance responsibilities.

Eligible historic buildings would be maintained consistent with National Park Service standards as funding permits.

Paleontological Resources

At the project level, BLM would continue to map fossil localities so as to avoid those localities during project implementation. If the locality cannot be avoided, permitted institutions or individuals would be contacted to properly map, record, and/or recover, if necessary, paleontological resources. BLM would cooperate with permitted institutions and/or individuals to map and record fossil localities.

Alternative D

Cultural Resources and Traditional Cultural Properties

BLM would conduct proactive inventories of archeological/historical sites as time permits.

Educational and public outreach programs would be provided as requested.

Paleontological Resources

Direction for managing paleontological resources would be same as for Alternatives A and B.

Lands and Realty

Goal 1 – Look for opportunities to acquire non-federal land or interest in non-federal land with important resources and resource uses.

Goal 2 – Provide land-use opportunities contributing to a sustained flow of economic benefits and meet local infrastructure needs while protecting or minimizing adverse impacts to resources and resource uses.

Land Use Authorizations

Management Common to All Alternatives

Land uses would be authorized by various means such as right-of-way grants, road use agreements and associated temporary use permits under several different authorities; leases, permits, and easements under section 302 of the Federal Land Policy and Management Act of 1976 (FLPMA); airport leases under the Act of May 24, 1928; and Recreation and Public Purposes (R&PP) leases. R&PP transfers are handled below under the *Land Ownership Adjustment* section.

Requests for land use authorizations would be analyzed and mitigation measures applied on a case-by-case basis in compliance with the NEPA process. Interim management policy and guidelines for land use authorizations in WSAs would be followed as appropriate. In accordance with current policy, land use authorizations would not be issued for uses which would involve the disposal or storage of materials which could contaminate the land (hazardous waste disposal sites, landfills, rifle ranges, etc.). Rights-of-way, leases, permits, or easements would not be required for those activities that are considered casual use of public lands.

New right-of-way facilities would be located within or adjacent to existing rights-of-way, to the extent practicable, in order to minimize adverse environmental impacts and the proliferation of separate rights-of-way. Right-of-way applications across roads that have been closed or

have seasonal restrictions would be analyzed on a case by case basis.

New communication site users would be grouped into existing facilities at established communication sites to reduce impacts and expedite application processing. Site plans would be completed prior to authorizing communication site uses in new areas. The use of alternative power sources would be considered where electric power is not available.

Section 368 of the Energy Policy Act of 2005 directs that the Secretary of the Interior, Department of Energy (DOE), USDA, Department of Commerce, and Department of Defense work together to identify energy corridors on federal land in the 11 western states. BLM is co-lead with DOE in the preparation of the Interagency West-wide Energy Corridor Programmatic EIS (PEIS) which is currently being prepared by an Interagency Corridor Planning Team. The Final PEIS will provide plan amendment decisions that will address numerous energy corridor related issues, including the utilization of existing corridors (enhancements and upgrades), identification of new corridors, supply and demand considerations, and compatibility with other corridor and project planning efforts. Decisions from this PEIS would be followed and implemented on Decision Area lands.

BLM would provide recreation and public purposes leases or patents on BLM land that meets classification criteria.

Proposals for renewable energy development would be considered on a case-by-case basis. No proposals for alternative energy development, other than wind power are anticipated to occur in the foreseeable future. Two areas, one near Whitehall and one near Livingston, are anticipated to have wind energy development in the future (**Map 40**). Guidelines and Best Management Practices (BMPs) from the Wind Energy Development Programmatic EIS (ROD signed December 2005) would be used when considering wind energy projects on BLM land. The latest version of *Suggested Practices for Raptor Protection on Power Lines* (APLIC 1996) would be implemented in the construction and operation of right-of-way facilities.

Owners of non-Federal land surrounded by public land managed under FLPMA would be allowed a degree of access across public land which would provide for the reasonable use and enjoyment of the non-Federal land.

The use of certain rights-of-way constructed on public lands prior to FLPMA would be recognized as a valid use even though the laws under which they were authorized were repealed by FLPMA. Recent regulations state that BLM would not renew grants issued before FLPMA. The holders of these authorizations must apply for a new FLPMA grant.

Alternative A – No Action

There would be no utility corridors formally designated under the No Action alternative. The Headwaters RMP designated avoidance areas for utilities in the Scratchgravel Hills, Sleeping Giant/Holter Lake, and Limestone Hills areas. Generally, areas of high public recreation use, high scenic and wildlife values, and residential areas would be avoided. Under this alternative 74,489 acres would remain designated as avoidance and 952 acres would be identified as "windows" where existing major facilities cross avoidance areas.

Management Common to Action Alternatives (B, C, and D)

The existing Communication Sites at Boulder, Bull Mountain, Limestone Hills, Montana City, Mt. Belmont, Toston, and Wickes would be formally designated as communication sites for the BFO. BLM would consider applications for new communications facilities and limit those uses to the designated sites. **Map 40** shows the existing sites. Any new facilities to be located within the designated sites would be required to conform to the existing site plans and the designated uses identified on **Table 3-28** in Chapter 3. Once the designated communications sites are filled to near capacity, new site location(s) may be authorized after site management plans and appropriate site-specific NEPA analyses are completed.

No new rights-of-way would be authorized in identified exclusion areas (approximately 27,361 acres). New rights-of-way in identified avoidance areas would not be allowed unless there are no other routing options (approximately 75,626 acres). Valid existing rights-of-way in avoidance areas would be recognized and holders of such authorizations would be allowed to maintain their facilities (**Map 40**).

Two of the existing right-of-way corridors delineated in the 1992 "Western Regional Corridor Study", (updated in 2003), would be designated where they cross public lands. The corridors are each currently occupied by electrical transmission lines. Nominal corridor width for the north-south oriented corridor would be 1,320 feet in width either side of the centerline of the existing facilities. The east-west oriented corridor would be 660 feet in width either side of the centerline of the existing facilities. Applicants for electrical transmission lines 69kV and larger and pipelines 10 inches in diameter and greater would be encouraged to locate such facilities within these two designated corridors. Each corridor would be designated for power lines (above ground and buried), telephone lines, fiber optic lines, pipelines, access roads, and other linear type right-of-ways. Specific proposals would require site-specific environmental analysis and compliance with permitting processes. Right-of-way facilities would not be placed adjacent to each other if

safety, incompatibility issues, or conflicts were identified.

Access to and along right-of-way corridors and use areas necessary to maintain existing facilities and construct new facilities would be provided across public lands. Other uses of right-of-way corridors and use areas would be permitted to the extent that they did not interfere with or preclude the use of these locations for their intended purpose and were consistent with other portions of the plan.

New leases, permits, rights-of-way, and easements would be authorized in a manner consistent with meeting Land Health Standards and applicable Best Management Practices. Renewals of existing authorizations would be analyzed, and if required, special stipulations would be added to meet or move toward meeting Land Heath Standards. In addition, an attempt would be made to negotiate changes in existing authorizations which would meet or move toward meeting Land Health Standards.

WITHDRAWALS AND CLASSIFICATIONS

Management Common to All Alternatives

In compliance with Section 204(1) of FLPMA, existing withdrawals would be reviewed prior to the end of the withdrawal period or as otherwise required by law to determine if they should be extended, revoked, or modified. Withdrawals no longer needed, in whole or in part, for the purpose for which they were withdrawn would be recommended for revocation or modification. Other agency requests for withdrawal relinquishments, extensions, or modifications would be considered.

Department of Interior and BLM policy will be followed in the consideration of any new withdrawals. New withdrawal proposals would be considered where land would transfer from one federal agency to another or where resource values or agency investments are best protected by withdrawal. Lands proposed to be withdrawn should be the minimum area required for the intended use and where applicable alternative prescriptions such as the use of rights-of-way, leases, permits, or cooperative agreements are inadequate to protect the resource values.

A Legislative Environmental Impact Statement is currently being prepared by the Department of Army, in cooperation with the BFO, for the withdrawal of approximately 20,000 acres of BLM land in the Limestone Hills west of Townsend. These lands were segregated from the public land laws by the Federal Register Notice of August 13, 2007, and are not currently open to surface entry or mining for a period of two years from the date of publication of the notice. Under all alternatives, the Congressional action resulting from this proposal/Legislative Environmental Impact Statement would subsequently amend the Butte RMP.

Land classifications are required to determine the suitability of public lands for retention or transfer out of Federal ownership under a number of public land laws (Recreation and Public Purposes Act, Carey Act, Indian Allotments, Desert Land Entries, State Selections). The only one of these laws applicable in this Planning Area is the Recreation and Public Purposes Act. Classifications are essentially determinations of a parcel's greatest value, or highest utilization, and are based on criteria in 43 CFR 2400.

Land classifications, as "de facto" withdrawals, would also be reviewed to determine if they should be continued or terminated. Any remaining Classification and Multiple Use Act retention classifications would be terminated.

All new classifications would comply with the requirements of 43 CFR 1600 and criteria in 43 CFR 2400. There is a "Recreation and Public Purpose" classification on 200 acres at the old Deep Creek Ski Area in T2N, R12W, Section 20: E½SW¼, W½SE¼, SE¼SE¼. This area is no longer being used for recreation purposes and therefore this classification would be terminated. The Last Chance Handgunners at Boulder have expressed interest in a patent, under the Recreation and Public Purposes Act, to their shooting range in T6N, R5W, Section 24: Lot 2 and Section 25: NE¼NE¼NW¼. This parcel has already been classified as suitable for R&PP lease. Under all alternatives the R&PP classification would be revised to allow for R&PP patent.

A total of approximately 6,300 acres of land are withdrawn from locatable mineral entry (with some exceptions primarily for Public Water Reserves described in Chapter 3). These withdrawals include the Devil's Elbow (142 acres), Holter Lake (80 acres) and Ringing Rocks (160 acres) recreation areas, totaling 382 acres that would remain in effect under all alternatives in order to safeguard infrastructural investments; protect resource values; and ensure quality visitor use experiences.

Alternative A – No Action

Withdrawals would be considered on a case-by-case basis, in accordance with current withdrawal and mineral policy.

Alternative B

Priority for new withdrawals would be for all developed recreation sites followed by new acquisitions through exchange or purchase, and in ACECs to protect resources and values as needed, in accordance with current withdrawal and mineral policy.

Specific sites recommended for withdrawal from mineral entry are identified in the Locatable Minerals section, under Alternative B and C. Eight priority recreation sites are identified for withdrawal due to special existing or planned conditions such as exclusive public recreation

uses for camping and day-use activities, high level of infrastructural development, highly concentrated visitation, and limited size.

Alternative C

Priority for new withdrawals would be for all developed recreation sites followed by new acquisitions through exchange or purchase, and in ACECs to protect resources and values as needed, in accordance with current withdrawal and mineral policy.

Specific sites recommended for withdrawal from mineral entry are identified in the Locatable Minerals section, under Alternative B and C. Eight priority recreation sites are identified for withdrawal due to special existing or planned conditions such as exclusive public recreation uses for camping and day-use activities, high level of infrastructural development, highly concentrated visitation, and limited size. Riparian areas in the Muskrat Creek drainage are also proposed for locatable mineral withdrawal to protect an important westslope cutthroat trout population.

Alternative D

Withdrawals would be considered on a case-by-case basis in accordance with current withdrawal and mineral policy.

LAND OWNERSHIP ADJUSTMENT

Management Common to All Alternatives

Land ownership adjustment refers to those actions that result in the disposal of BLM-administered land and/or the acquisition of non-federal land or interests. In this context, BLM land is categorized as either "retention" or "disposal". Generally, lands in the retention category would be retained and managed by BLM and lands in the disposal category would be available for land ownership adjustment. Methods of adjustment include exchanges, sales, transfers, fee acquisition, and donation. Land ownership adjustments would be considered on a case-by-case basis.

Public lands with high resource values would generally be retained in federal ownership. All proposed land ownership adjustment actions would be analyzed in project specific environmental reviews.

Public access would be maintained or improved through all land ownership adjustment transactions. Land transfers to other public agencies would be considered where improved management efficiency would result. BLM lands could be made available for community expansion if there are no other lands available to communities.

Direct purchase would be limited to cases where no practical alternatives exist and high public values would be acquired. Land and interests in lands obtained with LWCF appropriation would not be available for disposal by any means, nor would it be open to mineral entry or mineral leasing.

The need to protect newly acquired lands would be considered as part of the analysis prior to acquisition. If withdrawn, acquired lands would be managed under the terms and conditions of the withdrawal. Disposal parcels would be made available for all means of disposal (sale, exchange, R&PP, etc.). Some lands identified for disposal could be retained in public ownership based on site-specific application of the land ownership adjustment criteria. (See **Appendix L – Lands**)

In addition to meeting the disposal criteria, lands to be sold would meet the following disposal criteria from FLPMA:

- Such land must be difficult and uneconomic to manage as part of the public land base, and must not be suitable for management by another federal department or agency.
- Such land must have been acquired for a specific purpose and must no longer be required for that or any other federal purpose.
- Disposal of such land would serve important public objectives that can only be achieved prudently or feasibly if the land is removed from public ownership and if these objectives outweigh other public objectives and values that would be served by maintaining such land in federal ownership.
- If land status updates identify additional parcels administered by BLM, those lands would be managed in the same manner as adjacent parcels or those in the same vicinity in regard to retention or disposal.
- Federal minerals underlying non-Federal surface would generally be retained in federal ownership. However, an exchange of this type of mineral estate may be considered on a case-by-case basis if found to be in the public interest. The sale of this type of mineral interest under section 209(b) of FLPMA could be considered only if the requirements of the same were met.

No BLM lands in the BFO are suitable for Desert Land Entry.

Alternative A – No Action

Planning guidance with respect to land ownership adjustment would be the same as that provided by the 1984 Headwaters RMP and the 1979 Dillon MFP. Further and more specific guidance would be provided by the "Land Pattern and Land Adjustment, Supplement to the State Director Guidance for Resource Management Planning in Montana and the Dakotas, 1984" (USDI-BLM 1984b). This guidance was later amended by the 1989 State Director's guidance pertaining to access. This direction established land exchange as the predominant

method of land ownership adjustment. It also established retention, disposal, and acquisition criteria to be used in categorizing public land. Criteria in the supplement were used to identify retention and disposal zones within the Butte Planning Area. These zones would be applied in this alternative.

State Director Guidance for resource management planning in Montana and the Dakotas (USDI-BLM 1984b) provides criteria for retention or disposal, and for identifying acquisition priorities. Principle considerations would include public resource values, current use, and location, proximity to other agencies, manageability, and compatibility with adjacent land uses.

Non-Federal land to be acquired by the BLM through exchanges generally would be located in retention areas. BLM administered land to be sold would meet the disposal criteria identified in State Director Guidance and the criteria derived from FLPMA. The method of sale would be determined on a case-by-case basis with the goal of avoiding unnecessary hardships on current public land users and surrounding or adjacent landowners.

Management Common to Action Alternatives (B, C, and D)

Lands would be categorized as either retention or disposal for management purposes. Specific land ownership adjustment criteria developed for retention, disposal, and acquisition would be followed. (See **Appendix L – Lands)**

Lands identified for retention and disposal are displayed on **Map 41**. Approximately 298,408 acres would be in the retention category. These are lands that would generally not be subject to land ownership adjustments. High priority lands for retention and potential future acquisition by the BLM would include those in and immediately adjacent to special designation areas (ACECs, WSRs, WSAs, National Trail Corridors, SRMAs, and recreation sites) as well as habitat for priority and special status species. The goal of potential acquisitions in these areas would be to enhance the following attributes: resource values identified for the area, public access to and within the area, recreation opportunities that are compatible with the specific area, manageability of the area or sites, and wildlife habitat. Land acquisitions in these areas would be considered to be consistent with this RMP and therefore plan amendments would not be required.

Approximately 8,901 acres of land would be identified as available for disposal. These lands would be available for exchange or sale, subject to the criteria described in **Appendix L – Lands**. Legal descriptions of these parcels are located in **Appendix L – Lands**. Lands leased or conveyed under the Recreation and Public Purposes Act, would be classified for such disposal under Sec 7 of the Taylor Grazing Act (42 USC 315f) and 43 CFR 2400.

Right-of-way holders would be issued perpetual easements for their facilities prior to the disposal of any BLM parcels.

ACCESS

Management Common to All Alternatives

For the purposes of this section, access refers to the physical ability and legal right of the public, agency personnel, and authorized users to reach public land. BLM would acquire legal public access and administrative access to BLM land from willing landowners. Methods of accomplishing this would be through fee purchase, exchange, donation, and/or long-term land use agreements. Easement acquisition would be the predominant method of obtaining legal access. If necessary, when BLM parcels are patented in land ownership adjustments, existing access could be retained using appropriate patent reservations. Methods of accomplishing this would be through fee purchase, exchange, donation, reciprocal rights-of-way, and/or long-term land use agreements.

Alternative A – No Action

Access would continue to be sought based on planning guidance provided by the Headwaters RMP/EIS as supplemented by the State Director Guidance on Access (USDI-BLM 1989a). Legal public or administrative access would be obtained from willing landowners on a case-by-case basis as the need or opportunity arises using the criteria in the State Director's guidance. (See **Appendix L – Lands)**

In accordance with guidance in this latter document, the BFO would focus its access acquisition efforts on:

- Larger blocks of BLM-administered land which are designated for retention in BLM ownership.
- Areas with important resource values.
- Areas where public demand for access is high.
- Areas with substantial BLM investments.

Management Common to Action Alternatives (B, C, and D)

BLM would follow specific access criteria outlined in **Appendix L – Lands** for obtaining new access and managing existing access to BLM administered lands. Acquisition efforts would be focused on those routes designated as "open" in the travel plan that lack legal public access.

UNAUTHORIZED LAND USE

Management Common to All Alternatives

BLM would abate realty-related unauthorized use through prevention, detection, and resolution. Unauthorized use of BLM administered land would be resolved through termination, short or long-term authorization, sale, or exchange as appropriate. Resolution of trespasses would require settlement of trespass liabilities and reclamation of any resource damage.

Resolution of trespasses would be conducted in accordance with 43 CFR 9230.

ENERGY AND MINERALS

Goal 1 – Ensure that federal minerals are available for energy and mineral exploration and development.

Goal 2 – Manage exploration and development of mineral resources and ensure they are conducted in an environmentally sound manner.

Goal 3 – Where possible, conserve significant or unique geological features.

Management Common to All Alternatives

The BLM Energy and Non-Energy Mineral Policy, which references several existing acts, recognizes the nation's need for domestic sources of minerals, energy, and other resources and the responsibilities concerning the discovery, development, production and acquisition of minerals and metals. All Energy and Minerals exploration, development, and production activities would be managed to prevent unnecessary or undue degradation.

Alternative A – No Action

Mineral operations permits would identify requirements and BMP's necessary to avoid or minimize adverse effects on natural resources.

Management Common to Action Alternatives (B, C, and D)

For all exploration and mining proposals BLM would ensure operations take all practical measures to maintain, protect, or minimize disturbances to resources.

Mineral activity would be managed to meet, or move toward meeting, Land Health Standards.

Future changes to ESA listings of species or occupied habitats may require changes or modifications of proposed activities to comply with the requirements of the act.

Alternative B – Preferred Alternative

Where no alternative to road construction exists, roads (including roads in riparian areas) would be kept to the minimum necessary for the approved mineral activity. Roads and facilities would be closed and the landscape rehabilitated when no longer required for mineral or land management activities.

Alternative C

No new or existing mineral operations (salable, leasable, and locatable) would be allowed to construct new structures, support facilities, or roads inside Riparian Management Zones.

Alternative D

New and existing mineral operations (salable, leasable, and locatable) would be allowed to construct structures, support facilities, and roads within riparian areas using stipulations and BMPs when necessary. Roads and facilities no longer required for mineral or land management activities would be reclaimed to the best extent possible.

LEASABLE SOLID MINERALS

Management Common to All Alternatives

BLM would consider proposals for developing leasable minerals (coal, phosphate, sodium, potash, sulphur, oil shale, native asphalt, and solid and semi-solid bituminous rock) under the administration of the federal government on a case by case basis. Site specific environmental analysis would be required to lease these minerals.

LEASABLE FLUID MINERALS

Management Common to All Alternatives

Oil and Gas

Federal oil and gas leasing authority for public lands is found in the Mineral Leasing Act of 1920, as amended; and for acquired lands in the Acquired Lands Leasing Act of 1947, as amended. Leasing of federal oil and gas is affected by other acts such as the National Environmental Policy Act of 1969, the National Historic Preservation Act of 1966, FLPMA (1976), the Wilderness Act of 1964, the Endangered Species Act of 1973, as amended, and the Federal Onshore Oil and Gas leasing Reform Act of 1987. Regulations and other guidance governing federal oil and gas leasing and lease operations are contained in 43 CFR Group 3100, Onshore Operating Orders, Notices to Lessees, and BLM handbooks, manuals and instruction memorandums. Regulations governing geophysical exploration are found at 43 CFR 3150.

An oil and gas lease grants the lessee the right to explore for, extract, remove, and dispose of oil and gas deposits that may be found on the leased lands. The lessee may exercise the rights conveyed by the lease, subject to lease terms and any lease stipulations (modifications of the lease), and permit approval requirements.

The terms of existing oil and gas leases cannot be changed by the decisions in this document. When the lease expires, the area would be managed for oil and gas according to the decisions reached in this document.

The BLM planning process determines availability of federal mineral estate lands for oil and gas leasing (**Table 2-20**). For federal oil and gas where the surface is managed by another federal agency, the BLM would consult with that agency before issuing leases. In areas where oil and gas development may conflict with other resources, the areas may be closed to leasing in accordance with decisions made from this document. Regulations at part 43 CFR 3100.0-3(d); the Secretary's general authority to prevent the waste and dissipation of public property; and the Attorney General's Opinion of April 2, 1941 (Vol. 40 Op. Atty. Gen 41) allow the BLM to lease lands that are otherwise unavailable for leasing if oil and gas is being drained from such lands. If the unavailable lands were under the jurisdiction of another agency, leasing of such lands would only occur following consultation, and consent if necessary, from the surface managing agency.

Unavailable lands for this RMP (**Table 2-20**) would be leased only if a state or fee well is proposed or completed within the same spacing unit, or if the lands are within a producing unit. These lands would be leased with a no surface occupancy and no subsurface occupancy stipulation with no waiver, modification or exception provisions. There would only be a paper transaction with no physical impacts on the unavailable lands. There would be no exploration or development (drilling or production) within the unavailable lands. After issuance of a lease, the lease would be committed to a communitization agreement and the United States would then receive revenue in proportion to its acreage interest as it bears to the entire acreage interest committed to the agreements.

Areas where oil and gas development could coexist with other resource uses would be open to leasing under standard lease terms or with added stipulations. Stipulations are a part of the lease only when environmental and planning records show the need for them. Three types of stipulations describe how lease rights are modified: no surface occupancy, timing limitation (seasonal restriction), and controlled surface use. (For descriptions, see "Leasing Process" in the "Oil and Gas" section of **Appendix M – Fluid Minerals)** Stipulations may be changed by application of waivers, exceptions, or modifications. The decision whether to grant waivers, exceptions, or modifications generally occurs during the Application for Permit to Drill approval process. If the authorized officer determines the change to be substantial, the preferred alternative would be subject to a 30-day public review period. Waivers are a permanent exemption from a lease stipulation. This occurs when the resource does not require the protection of stipulation. Exceptions are granted on a case-by-case basis. Each time the lessee applies for an exception, the resource objective of the stipulation must be met. Modifications are fundamental changes to the provisions of a lease stipulation either temporarily or for the term of the lease.

Table 2-20
Acres of Federal Mineral Estate Available or Not for Fluid Mineral Leasing

	Alternative A	Alternative B	Alternative C	Alternative D
Acres Available for Oil and Gas Leasing[1]	**597,384**	**623,420**	**71,812**	**615,788**
No Surface Occupancy	251,779	280,312	23,903	93,288
Timing Limitations	285,993	286,800	0	436,410
Controlled Surface Use	27,701	38,365	30,893	32,011
Standard Lease Terms	31,911	17,943	17,016	54,079
Acres Unavailable for Oil and Gas Leasing	**54,810**	**28,774**	**580,382**	**36,406**
Non-discretionary	28,774	28,774	28,774	28,774
Discretionary	26,036	0	551,608	7,632

[1]- Acreages by subcategory were calculated such that each column of subcategories under each alternative adds up to the total available acres for leasing based on the following general concepts where multiple stipulations overlapped: No Surface Occupancy stipulations override and are more restrictive than Timing Limitations, Controlled Surface Use, and Standard Lease Terms. Timing Limitation stipulations override and are more restrictive than Controlled Surface Use and Standard Lease Terms. Controlled Surface Use stipulations override and are more restrictive than Standard Lease Terms. Non-overlapping individual stipulation-specific acreages are displayed by alternative in Chapter 4 in Tables 4-23, 4-27, 4-30, and 4-33.

On Bureau of Reclamation lands, in addition to the resource specific stipulations under each alternative (e.g., wildlife, recreation); stipulations that are recommended by the Bureau of Reclamation would be used (see Oil and Gas section in **Appendix M – Fluid Minerals).**

Additional information can be provided to the lessee in the form of a lease notice. This notice does not place restrictions on lease operation, but does provide information about applicable laws and regulations, and the requirements for additional information to be supplied by the lessee.

New information may lead to changes in existing resource inventories. New use areas and resource locations may be identified or use areas and resource locations that are no longer valid may be identified. These resources usually cover small areas requiring the same protection or mitigation as identified in this plan. Identification of new areas or removal of old areas that no longer have those resource values would result in the use of the same lease stipulation identified in this plan. These areas would be added to the existing data inventory without a plan amendment. In cases where the changes constitute a change in resource allocation outside the scope of this plan, a plan amendment would be required.

After lease issuance, the lessee may conduct lease operations with an approved permit. Proposed drilling and associated activities must be approved before beginning operations. The operator must file an Application for Permit to Drill or Sundry Notice that must be approved according to (1) lease stipulations, (2) Onshore Oil and Gas Order, and (3) regulations and laws. (See "Permitting" in the "Oil and Gas" section **of Appendix M – Fluid Minerals)**

Development of coal bed natural gas in and around Bozeman Pass in Gallatin County would be constrained by the zoning regulations developed for the Bozeman Pass Zoning District recently established by Gallatin County. These regulations established coal bed natural gas development as a "Natural Resources Conditional Use." These uses are allowed upon obtaining a Natural Resource Conditional Use Permit through the county as described in the zoning district regulations.

None of the lands within the Sheep Creek, Black Sage, Sleeping Giant, Elkhorns Tack-on, Humbug Spires, or Yellowstone Island Wilderness Study Areas would be available for oil and gas leasing under any of the alternatives unless they are released from their existing status, at which point they would be managed under the terms and conditions of the selected alternative identified from this RMP.

Geothermal

Lands in the Planning Area would be available for geothermal leasing, unless located within wilderness or WSAs or in instances where it is determined that issuing the lease would cause unnecessary or undue degradation to public lands or resources. There are Known Geothermal Resource Areas in the Planning Area at Boulder Hot Springs, Corwin Springs, and Marysville. A site-specific environmental analysis would be prepared should interest be expressed in exploring for or developing geothermal resources in the Planning Area. This analysis would address the application of stipulations and develop any additional mitigating measures over and above the lease stipulations required.

Stipulations developed in this document for oil and gas leases would be applied to any geothermal lease issued if appropriate. Geothermal exploration and production activity is sufficiently different from oil and gas that the stipulations developed for oil and gas may not be appropriate and could be modified.

Geophysical Exploration

Oil and gas geophysical activity which is administered by the BLM is governed by regulations found at 43 CFR Subparts 3150, 3151, and 3154. Additional guidance is found in BLM Manual Section 3150 and Handbook 3150. For additional information on geophysical operations and the BLM's procedures and regulations see the "Geophysical Operations" portion of the oil and gas section of the **Appendix M – Fluid Minerals.**

The BLM would review Notices of Intent to Conduct Geophysical Exploration in the Planning Area and develop appropriate mitigation measures so as not to create undue and unnecessary degradation. A site-specific environmental analysis would be prepared for each NOI filed.

Alternative A – No Action

Under the continuation of current management, approximately eight percent (54,810 acres) of BLM subsurface ownership administered by the BFO would not be available for oil and gas leasing (**Table 2-20**). This includes the Sleeping Giant, Sheep Creek, Elkhorns Tack-on, Black Sage, Humbug Spires, and Yellowstone Island WSAs. Other areas unavailable for oil and gas leasing in this alternative include core areas of state wildlife management areas.

The remainder of federal mineral estate lands would be available for leasing, subject to the stipulations specified in **Table 2-21, Appendix M – Fluid Minerals,** or under Standard Lease Terms. **Map 42** depicts lands available and unavailable for leasing under Alternative A.

Alternative B – Preferred Alternative

Approximately four percent (approximately 28,774 acres) of BLM-administered federal mineral estate lands in the Planning Area would not be available for oil and gas leasing (**Table 2-20**). This includes the Sleeping Giant, Sheep Creek, Elkhorns Tack-on, Black Sage, Humbug Spires, and Yellowstone Island Wilderness Study Areas. The remainder of federal mineral estate

lands in the Planning Area would be available for leasing, subject to the stipulations specified in **Table 2-21, Appendix M – Fluid Minerals,** or to Standard Lease Terms. **Map 43** depicts lands available and unavailable under Alternative B.

The timing limitation applied to sage grouse breeding habitats would be based on a three mile buffer for the BFO area rather than a more generally accepted two mile buffer. Radio telemetry studies in southwest Montana indicate that some populations of sage grouse are migratory and move considerable distances during their annual life cycle, including during their nesting season.

In addition, habitat in the Planning Area is unevenly distributed. Based on the most current research examined in the Western Association of Fish and Wildlife Agencies' guidelines (Connelly et al. 2000), a five kilometer buffer is recommended for unevenly distributed habitats (thus the three miles for the BFO). The timing restriction applies to potentially suitable sage grouse habitat (sagebrush areas with adequate sage cover for nesting); therefore, not all acres within the three-mile buffer would be affected by the stipulation. Timeframes for the timing limitation have also been adjusted to limit use from March 1 through June 30 rather than March 15 through June 15. This is because higher elevations in the southwest part of Montana (in comparison to eastern Montana) result in later use of breeding and nesting areas in certain portions of the Planning Area, while information from radio telemetry studies show use of low elevation leks as early as March 1.

Alternative C

Under Alternative C, approximately 89 percent (580,382 acres) of BLM subsurface ownership administered by the BFO would not be available for oil and gas leasing (**Table 2-20**). This includes the WSAs identified in Alternative B, plus lands in these additional locations:

- Prairie Dog Towns
- Sage Grouse Winter/Spring Range
- Lands within 0.5 mile of Sage Grouse Strutting Grounds (leks)
- State Wildlife Management Areas
- Big Game Winter/Spring Range
- Elk Calving/Big Game Birthing Areas
- Lands within 1 mile of Bald Eagle Nesting/Breeding areas
- Lands within 0.5 mile of Raptor Breeding Areas
- Lands within 1 mile of peregrine falcon breeding territories
- Lands within 0.5 mile of ferruginous hawk breeding territories
- Lands within 1 mile of 99 to 100 percent pure westslope cutthroat trout habitats
- Yellowstone Cutthroat Habitat
- Municipal Watersheds
- Lands recently acquired with LWCF funds.

The remainder of mineral estate in the Planning Area would be available for leasing, subject to the stipulations specified in **Table 2-21, Appendix M – Fluid Minerals** or to Standard Lease Terms. **Map 44** depicts lands available and unavailable under Alternative C.

Alternative D

Under Alternative D, approximately six percent (36,406 acres) of BLM subsurface ownership administered by the BFO would not be available for oil and gas leasing, including the WSAs (**Table 2-20**) and lands recently acquired with LWCF funds. The remainder of mineral estate in the Decision Area would be available for leasing, subject to the stipulations specified in **Table 2-21, Appendix M – Fluid Minerals** or to Standard Lease Terms. **Map 45** depicts lands available and unavailable under Alternative D.

Table 2-21
Lease Terms and Stipulations by Alternative

Key
TL Timing Limitation Stipulation
CSU Controlled Surface Use Stipulation
SLT Standard Lease Terms
NSO No Surface Occupancy Stipulation
NL No Lease
NA Not Applicable
Distances are enumerated and those equal or greater than 100 are feet and those 3 or less are miles. Time periods are month/day.

Resource	Alt A	Alt B	Alt C	Alt D
Wildlife				
Grizzly Bear – Recovery Zone	CSU	NSO	NSO	CSU
Grizzly Bear – Denning Habitat (Distribution Zone)	CSU	TL 4/1-6/30, 9/15-10/15	NSO	CSU
Gray Wolf Dens – Former NW MT Recovery Area	CSU	TL 4/15-6/30 1	NSO 1	CSU
Prairie Dog Towns	NSO ¼	NSO	NL	NSO
Sage Grouse Winter/Spring Range	TL 3/1-6/30	TL 12/1-5/15	NL	TL 12/1-5/15
Sage Grouse Strutting Grounds (leks)	NSO 500	NSO ¼	NL ½	NSO ¼
Sage Grouse Breeding Habitat	TL 3/1-6/30 ¼	TL 3/1-6/30 3	NSO 3	TL 3/1-6/30 3
Wildlife Management Areas	NL/NSO	NSO	NL	NSO
Big Game Winter/Spring Range	TL 12/1-5/15	TL 12/1-5/15	NL	TL 12/1-5/15
Elk Calving/Big Game Birthing Areas	TL 5/1-6/30	TL 4/1-6/30	NL	SLT
Bighorn Sheep Yearlong Range	TL 12/1-5/15	TL 11/1-6/30	NL	TL 11/1-6/30
Bighorn Sheep Core Areas	TL 12/1-5/15	NSO	NL	SLT
Bald Eagle Nest Sites/Breeding Habitat	NSO ½ + TL 2/1-8/31 1	NSO ½ + TL 2/1-8/31 1	NL 1	NSO ½ + TL 2/1-8/31 1
Raptor Breeding Territories (Golden eagle, Prairie falcon, Swainson's Hawk)	NSO ¼	TL 3/1-7/31 ½	NL ½	SLT
Peregrine Falcon Nest Sites/Breeding Habitat	NSO ¼	NSO 1	NL 1	NSO 1
Ferruginous Hawk Breeding Territories	NSO ¼	NSO ½	NL ½ + TL 3/1-8/31 1	TL 3/1-7/31 ½
Threatened and Endangered Species	CSU	CSU	CSU	CSU
Fisheries				
Westslope Cutthroat Trout Habitat (90-99% pure)	NSO ¼	NSO ½	NSO ½	CSU ½
Westslope Cutthroat Trout Habitat (99-100% pure)	NSO ¼	NSO ½	NL ½	NSO ½
Fluvial/Adfluvial Arctic Grayling Habitat	NSO ¼	NSO ½	NSO ½	CSU ½
Bull Trout Habitat	CSU ½	NSO ½	NSO 1	NSO ½
Yellowstone Cutthroat Trout Habitat (90-100% pure)	NSO ¼	NSO ½	NL ½	CSU ½
Streams with High Restoration Potential – Native Fish	NA	NSO ½	NA	NA
Class 1 Fisheries (Blue Ribbon)	NSO 1000	NSO ½	NSO 1	CSU ½
Recreation				
Developed Sites	NSO 300	NSO ¼	NSO ½	CSU ¼
Special Recreation Management Areas	SLT	CSU	NSO	SLT
Cultural and Paleontological Resources				
Cultural and Paleontological Resources Inventory Requirement	CSU	CSU	CSU	CSU
National Register of Historic Places Eligible Properties/Districts and Paleontological Localities	NSO 300	NSO 300	NSO 300	NSO 300
Traditional Cultural Properties	SLT	NSO ½	NSO ½	NSO ½
Visual Resources				
VRM Class II, III & IV Areas	CSU	CSU	CSU	SLT
Vegetation, Wetlands, Riparian and Water Quality				

Table 2-21
Lease Terms and Stipulations by Alternative

Key
TL Timing Limitation Stipulation
CSU Controlled Surface Use Stipulation
SLT Standard Lease Terms
NSO No Surface Occupancy Stipulation
NL No Lease
NA Not Applicable
Distances are enumerated and those equal or greater than 100 are feet and those 3 or less are miles. Time periods are month/day.

Resource	Alt A	Alt B	Alt C	Alt D
Wetlands, Floodplains and Riparian Areas	NSO 500, 1000	NSO	NSO	NSO
Special Status Plant Habitats	CSU	CSU	CSU	CSU
Known or Discovered Special Status Plants or Populations	NSO ¼	NSO ¼	NSO ½	NSO
Municipal Watersheds	SLT	NSO	NL	CSU
Soils				
Areas of mass wasting, unstable land areas, slopes >20 percent on Boulder Batholith Soils or >30 percent on non-Boulder Batholith Soils	CSU	CSU	CSU	SLT
Trails, Rivers and Special Designations				
Continental Divide National Scenic Trail (Marysville)	NSO 300	NSO ½	NSO ½	SLT
Lewis & Clark National Historic Trail	SLT	NSO ½	NSO 1	SLT
Rivers Suitable for WSR Designation	NSO 1000	NSO ½	NSO 1	NA
Lands & Realty				
Lands Acquired with Land and Water Conservation Funds	NA	NSO	NA	NA
R&PPs and 2920 Authorizations	SLT	NSO	NSO	NSO

LOCATABLE MINERALS

Management Common to All Alternatives

The BLM recognizes that public lands are an important source of the Nation's energy and non-energy mineral resources. The BLM is responsible for making public lands available for orderly and efficient development of these resources under principles of Multiple Use Management, and the concept of Sustainable Development.

BLM would provide opportunities for mineral exploration and development.

BLM would ensure accessibility to mineralized areas for exploration and development.

No casual use areas of concern or suction dredge use areas would be identified or designated.

BLM would strive to provide for timely permit evaluation and processing of federal energy and solid mineral exploration and development proposals.

A Plan of Operations would always be required (instead of a Notice) when there are lands or waters known to contain federally proposed or listed threatened or endangered species or their proposed or designated critical habitat, unless BLM allows for other action under a formal land-use plan or threatened or endangered species recovery plan. Land tracts where resource values (i.e., sensitive status or priority species, visual corridors, adjacent land restrictions, substantial cultural resource sites and fossil localities, etc.) may require special measures to prevent unnecessary or undue degradation during mineral exploration (and geophysical exploration) and development would be identified.

BLM would develop and implement measures to prevent unnecessary and undue degradation from exploration, mining, and reclamation activities. BLM would also develop conditions of approval and implementation guidelines (BMPs) to minimize impacts to natural resources including significant cultural resource sites and fossil localities caused by locatable mineral development.

Reclamation and restoration activities would be monitored to determine effectiveness of the practices.

For locatable minerals, placer mining operations, reclamation activities would be required to restore the stream channel and riparian habitat to functioning condition as close to pre-mining conditions as possible.

As information becomes available, known areas of geological hazards (for example landslide prone areas, avalanche areas, rock fall areas and unstable ground) would be mapped.

A total of approximately 6,300 acres of land are withdrawn from locatable mineral entry (with some exceptions primarily for Public Water Reserves described in Chapter 3). These lands would remain withdrawn under all alternatives.

The Devil's Elbow and Holter Lake recreation areas totaling 171 acres located on Hauser Lake would continue to be withdrawn due to their high level of visitation, development, and exclusive use for concentrated recreation activities. These recreation areas include four developed sites (Devil's Elbow, Clark's Bay, Two Camps Vista, and Holter Lake).

The Ringing Rocks area totaling 160 acres would continue to be withdrawn from mineral entry in order to protect this unique geological feature.

Approximately 5,700 acres of land acquired with Land and Water Conservation Funds since development of the Headwaters RMP and Dillon Management Framework Plan would not be opened to locatable mineral entry.

Alternative A – No Action

No additional areas would be proposed for mineral withdrawal.

Locatable minerals would be managed as described under "Management Common to All Alternatives."

Alternative B

Locatable minerals would be managed as described under "Management Common to All Alternatives" and "Management Common to Action Alternatives" under Energy and Minerals.

Under Alternative B, in addition to the approximately 6,300 acres previously described as withdrawn under "Management Common to All Alternatives", approximately 198 acres would be proposed for withdrawal from mineral entry. These acres would be in highly visited and developed recreation sites that are exclusively used and constitute substantial financial investments by BLM (**Table 2-22, Map 46**).

Table 2-22
Recreation Areas Proposed For Withdrawal From Mineral Entry Under Alternatives B and C

Site Name	Approximate Acres
Departure Point	5
Divide Bridge	8
Divide Campground	17
French Bar	44
Holter Dam	13
Log Gulch	39
Spokane Bay	8
White Sandy	64
Total Acres	**198**

Alternative C

Locatable minerals would be managed as described under "Management Common to All Alternatives" and "Management Common to Action Alternatives" under Energy and Minerals.

Under Alternative C, in addition to the 6,300 acres previously described as withdrawn under "Management Common to All Alternatives", and the 198 acres in recreation sites proposed for withdrawal under Alternative B (**Table 2-22**), approximately 180 acres of riparian areas in Muskrat Creek and Nursery Creek would also be proposed for withdrawal from mineral entry (**Map 46**). Under Alternative C an additional total of 378 acres would be proposed for mineral withdrawal compared to the existing withdrawal acreage.

The Muskrat/Nursery Creek proposed withdrawal is intended to protect habitat for a genetically pure westslope cutthroat trout population (sensitive species) that has undergone a successful interagency restoration project over the past 10 years. Funding and labor from the USDA Forest Service, BLM, MFWP, Montana State University, and Trout Unlimited have successfully eradicated non-native brook trout from Muskrat Creek, thus creating a currently thriving genetically pure westslope cutthroat trout population. Muskrat Creek has importance to westslope cutthroat trout restoration beyond the local level because after the ten year, $50,000 restoration effort, its population is now used as a donor source to reestablish westslope cutthroat trout in a number of different locations in the State of Montana. Montana Fish, Wildlife and Parks has identified Muskrat Creek as having the most secure and strongest population of westslope cutthroat trout in the entire Elkhorn Mountain range (Lee Nelson, MFWP Fisheries Biologist, personal communication 2006).

Westslope cutthroat trout have declined in abundance, distribution, and genetic diversity throughout their native range. In the Missouri River drainage of Montana genetically pure westslope cutthroat trout are estimated to persist in less than 5 percent of the habitat they once occupied. To prevent listing under the Endangered Species Act, federal and state managers need to ensure conservation of local populations, preservation of genetic diversity and work towards the long-term, self-sustaining persistence of westslope cutthroat trout (MFWP 1999b).

The 180 acres proposed for the Muskrat/Nursery Creek withdrawal would provide the minimum amount of protection to water quality, stream morphology, and riparian function to protect the restored and unique population of westslope cutthroat trout. This withdrawal would protect the genetically pure westslope cutthroat trout population in Muskrat Creek by preventing loss of riparian vegetation, streambed and bank destabilization, erosion and sedimentation, loss of floodplain vegetation, alteration of floodplain morphology, and alteration of

stream channel morphology that could occur in association with locatable mineral activity, particularly placer mining. Another key impact that placer mining (including casual use) could have on westslope cutthroat trout, is excavation, crushing or disturbance of streambed gravels during the critical period when trout are spawning and eggs are incubating/hatching (June 15 through August 31). If mining operations cause a decline in the population, the population could no longer be able to function as a donor source for Montana and impede restoration efforts.

Muskrat and Nursery Creek are located in the southern Elkhorn WSA which was evaluated in the joint Bureau of Mines and USGS report Mineral Summary Bureau of Land Management Wilderness Study Areas in Montana (1990). In the Muskrat and Nursery Creek areas the report concluded that there is high resource potential for copper, molybdenum and tungsten with a certainty level of D (available information clearly defines the level of mineral resource potential, the highest level of confidence), as well as a moderate mineral resource potential for uranium and thorium with a certainty level of C (Available information gives a good indication of the level of resource potential, US DOI Bureau of Mines and USGS, 1990).

No potential for placer mining has been identified in either Muskrat or Nursery Creek; therefore there is a very low probability of any proposals being submitted to the BLM. In the absence of a mineral withdrawal, should a miner propose to conduct placer mining in these drainages, timing stipulations could be attached to the permit to protect critical periods of spawning and incubation/hatching. Should lode mining be proposed for any of resources identified in the Bureau of Mines report mining practices, BMPs, reclamation/rehabilitation techniques, and bonding would be applied. If unavoidable impacts were to occur they would be mitigated through restoration at the conclusion of mining to the extent practicable. In spite of these measures, minerals operations that substantially reduce the size of the westslope cutthroat trout population and/or have long-term substantial adverse effects on aquatic habitat could eliminate the ability to use this fish population as a donor source to re-establish other populations.

Alternative D

A total of approximately 6,300 acres would remain withdrawn from mineral entry. Many acres of BLM administered lands along the Missouri River Chain of lakes are included in Power Site Reserve and Power Project withdrawals. Many of these lands are adjacent to existing reservoirs and power projects. No additional areas would be proposed for mineral withdrawal.

Locatable minerals would be managed as described under "Management Common to All Alternatives" and as described under "Management Common to Action Alternatives" under Energy and Minerals.

Salable Minerals

Management Common to All Alternatives

BLM would dispose of salable minerals on unpatented mining claims only for a public purpose when no reasonable alternative exists. Salable mineral sites would have an approved mining and reclamation plan and an environmental analysis prior to being opened. Mineral material would be sold at a fair market value to the public, but would be free to state, county, or other local governments when used for public projects. Mineral material sales would be processed on a case-by-case basis.

Alternative A – No Action

The BLM would authorize the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay, and petrified wood) from the federal government through a contract of sale (by the ton or cubic yard) or a free-use permit unless specific circumstances dictate otherwise. Extraction of materials from previously disturbed sites would be encouraged and all impacts to natural resources would be minimized.

Alternative B – Preferred Alternative

The BLM would continue to authorize the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay, and petrified wood) from the federal government through a contract of sale (by the ton or cubic yard) or a free-use permit unless specific circumstances dictate otherwise. Extraction of materials from previously disturbed sites would be encouraged. All development and operating impacts to natural resources and local residence would be minimized.

Alternative C

The BLM would not allow the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay and petrified wood), unless desired by the state or counties, or within existing community pits.

Alternative D

The BLM would authorize the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay, and petrified wood) from the federal government through a contract of sale (by the ton or cubic yard) or a free-use permit unless specific circumstances dictate otherwise.

Abandoned Mine Lands

Goal 1 – Reclaim AML sites on public land to improve water quality, plant communities, and diverse fish and wildlife habitat.

Goal 2 – Reduce and/or eliminate risks to human health from hazardous mine openings.

Goal 3 – Protect historic resources and wildlife habitat commonly associated with AML sites.

Management Common to All Alternatives

To the extent possible on BLM lands, BLM would strive to meet state and federal water quality standards in watersheds impacted by historic mining.

BLM would assess level of risks at AML sites and prioritize for reclamation based on standardized risk assessment. Reclamation would be implemented at the highest risk sites first.

Where deemed appropriate by BLM personnel, BLM would restore severely impacted soils and watersheds as close as possible to pre-disturbed conditions that support productive plant communities and ensure properly functioning watersheds.

Closures of dangerous inactive and abandoned mine sites would be designed to reduce the risks to human health and safety, restore the environment, and protect geological and cultural resources and meet or move toward meeting Land Health Standards.

Restoration and reclamation activities and repositories would be monitored to determine effectiveness of reclamation practices.

Operation, maintenance, and evaluation activities would be conducted in a manner to ensure the effectiveness of the selected remediation.

To the extent possible on BLM lands, BLM would strive to meet state and federal air quality standards in the interest of protecting human health potentially impacted by fugitive dust emissions.

All resource activities would be required to reclaim and restore AML or hazard reduction sites to the extent necessary to protect work performed on the site.

Hazardous Materials Management

Goal 1 – Minimize threats and reduce risks to the public and environment from hazardous materials.

Management Common to All Alternatives

BLM would comply with all appropriate laws and regulations regarding hazardous materials. Disposal of hazardous materials on public lands would not be permitted. When the use or storage of hazardous materials is authorized (i.e. in mining operations or other types of commercial activities) special stipulations would be applied to comply with appropriate laws, regulations, and policies. In the event of hazardous materials incidents on public land, standard operating procedures would be used to respond. Cleanups and reclamation would be conducted in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan and the NEPA decision.

BLM would promote and support the appropriate use and recycling of hazardous materials in public facilities and on public land to prevent or minimize the generation and disposal of hazardous wastes.

BLM would minimize and remediate hazardous materials spills or incidents.

Environmental Site Assessments would be conducted for land acquisitions, land disposals, and for right-of-ways if applicable. Land uses would be authorized and managed to reduce the occurrence and severity of hazardous materials incidences on public land.

BLM would assess level of risk at hazard sites and conduct remediation at highest priority sites that are the greatest risks to the public and environment.

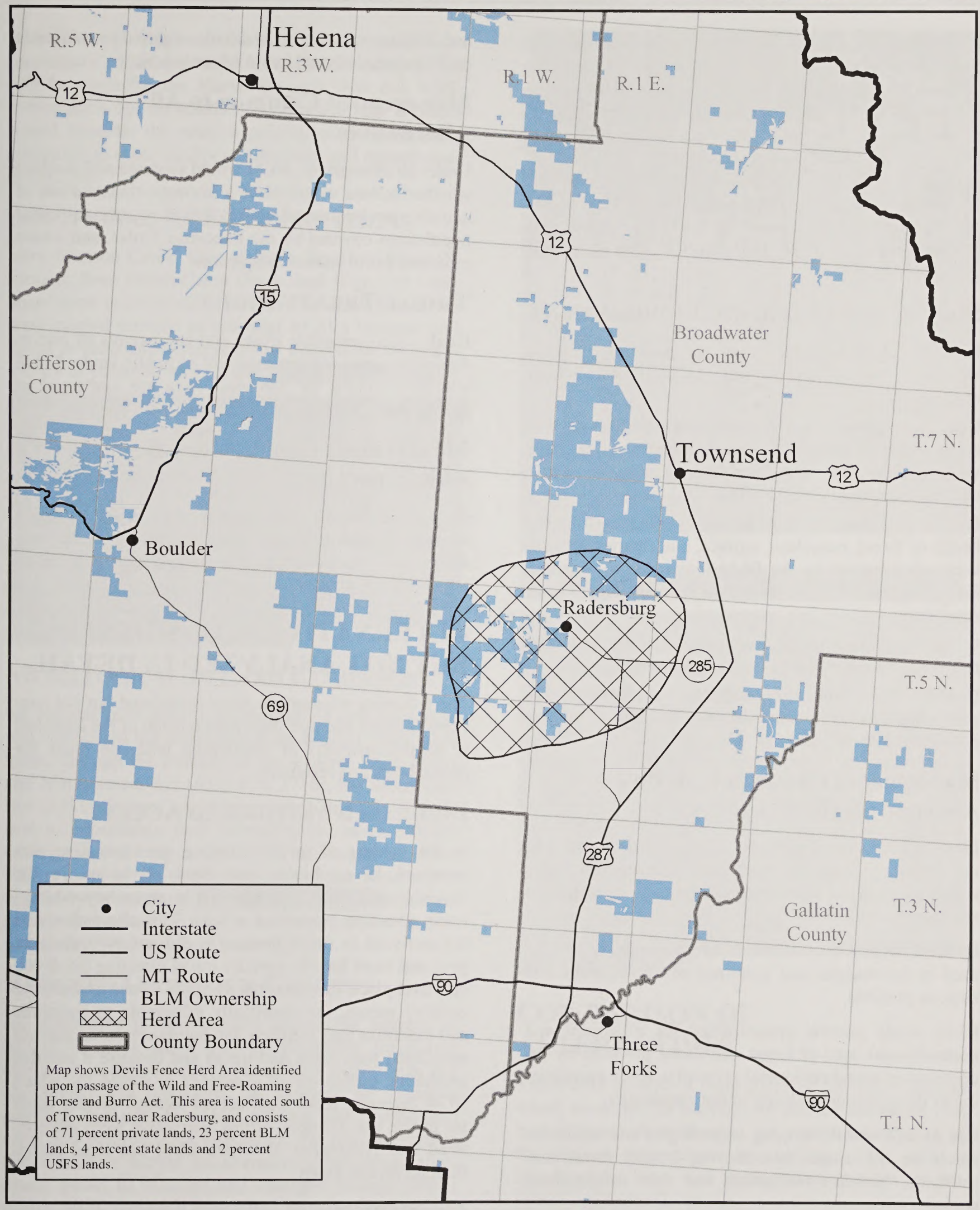
Pollutants, such as flammable liquids and lubricants, would be prevented from entering streams by storing outside of riparian areas, having a spill prevention and control plan, and not allowing refueling within riparian areas (with the exception of permitted mining activities, fire suppression activities, reclamation work and chainsaw re-fueling).

WILD HORSES AND BURROS

Management Common to All Alternatives

Herd areas are public lands identified as being habitat used by wild horses and burros at the time of passage of the Wild and Free-Roaming Horse and Burro Act. At the time of the passage of the Act, a Wild Horse Herd Area called the Devils Fence Herd Area was designated. This herd area is between Townsend and Radersburg (**Map 47**). The herd area is predominantly private and State of Montana lands intermingled with BLM and USFS lands dispersed in a fragmented manner throughout the area. Of the approximately 69,725 acres in the Devils Fence Herd Area, there are 49,592 acres of private lands (71 percent); 16,231 acres of BLM (23 percent); 2,868 acres of state land (4 percent); 1,032 acres of USFS land (2 percent), and 2 acres of local government land. Additionally, several fences partition this area among the many landowners which would further inhibit the free roaming nature of said horses. This area has not been used by, or managed to support wild horses since 1977 due to habitat limitations, and land ownership patterns. In 1977 the area was closed to wild horse use and twelve wild horses were gathered and removed in the Devils Fence area in compliance with the Act. Conditions have changed little since 1977 when this herd was eliminated.

Under the current situation as well as the foreseeable future, the Devils Fence Herd Area is not conducive for the long term maintenance and management of wild



0 12 Miles

Map Scale 1:1,500,000

Map generated by the Butte Field Office in April 2008

Albers Equal Area, NAD83 Projection

This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.

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Map 47: Devils Fence Herd Area

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Butte Field Office
Proposed RMP/Final EIS

horses that would result in healthy self-sustaining wild horses in a thriving natural ecological balance. In order to manage for wild horses in this area, private land owners would have to request that large portions of their private property be made available to the BLM, and private fences would have to be removed to allow animals to freely roam between land owners. Under all RMP alternatives the Devils Fence Herd Area would continue not to be managed for wild horse use, and therefore would not be designated herd management area (HMA) status.

Social and Economic Environment

Goal 1 – Provide opportunities for economic benefits while minimizing adverse impacts on resources and resource uses.

Goal 2 – Provide for a diverse array of activities that result in social benefits for local residents, businesses, visitors, interested citizens, and future generations, while minimizing negative social effects.

Goal 3 – Sustain, and where appropriate, restore the health of forest, rangeland, aquatic, and riparian ecosystems administered by the BLM to provide a sustained flow of economic benefits within the capability of the ecosystem.

Goal 4 – Protect visual quality, wildlife habitats, and recreation opportunities to sustain non-market values.

Goal 5 – Make resource commodities available to provide a sustainable flow of economic benefits within the capability of the ecosystem.

Management Common to Action Alternatives (B, C, and D)

Identified Special Recreation Management Areas and the remaining Extensive Recreation Management Areas would be managed for identified user markets, activities, and experience levels.

Collaborative and/or stewardship processes would be used in the analysis and treatment of all resources and uses, as possible.

BLM would provide opportunities for traditional and nontraditional uses of forest and forest products by incorporating sound ecological principles while contributing to the economic stability of the community.

Use of new and developing technologies and industries would be encouraged in achieving healthy forest, stewardship, biomass utilization, and fuel management goals.

Environmental Justice (EJ)

Goal – Identify and remediate to the extent possible disproportionate negative effects to minority or low income populations per Executive Order 12898 – "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations". Evaluate and disclose whether actions have negative consequence on EJ populations and avoid where practical.

Management Common to All Alternatives

Under all alternatives, BLM would evaluate and disclose whether actions would place a disproportionate share of negative environmental consequences on any particular populations covered by the Executive Order, and where practical, avoid such consequences.

Tribal Treaty Rights

Goal – Accommodate treaty and legal rights of Native American groups in management of public lands. Tribal treaties affecting the Decision Area are contained in **Appendix K – Cultural Resources**.

Management Common to All Alternatives

BLM would notify and consult with tribes on BLM actions. Consultation and coordination would be conducted on a government to government basis with federally recognized tribes.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

The following alternatives were considered but not analyzed in detail because they were outside of the technical or legal constraints of developing land use plans for public lands and resources.

Increased Motorized Access

In the context of travel planning, an alternative was proposed to emphasize motorized recreation in the Scratchgravel Hills and Marysville areas beyond currently available motorized access. This alternative was not analyzed in detail because it did not meet the purpose and need for site-specific travel planning (to develop travel plans that meet the needs of public and administrative access, are financially affordable to maintain, and minimize user conflicts and natural resource impacts associated with roads and trails) and because it entailed promoting public use of a number of routes for which BLM currently lacks legal access through private lands for public use. Portions of this alternative were incorporated into Alternative D where BLM has legal access through private lands.

Construction of a Campground and Motorized Trailhead in the Marysville Area

Construction of campgrounds and trailheads are generally activity plan decisions not regularly addressed at the RMP scale. Construction of these facilities could follow

in the future if they are found to be consistent and complementary to the travel plan and RMP decisions that will be made for the Marysville area with this RMP. Future decisions on whether to construct these facilities would consider the relative priority of these facilities compared to other facility construction and maintenance in the BFO.

Additional ACEC Nominations

Jerry Johnson Creek, City of Butte Big Hole River Diversion, Soap Gulch-Camp Creek, and High Ore Creek areas were nominated as ACECs. None of these areas were carried forward as potential ACECs because each failed to meet either relevance or importance criteria to qualify as potential ACECs (see **Appendix I – ACECs**).

During the public comment period for the Draft RMP/EIS, public comments were received suggesting ACEC expansions or new ACEC designations not previously received during public scoping, and therefore not considered in the Draft RMP/EIS. Due to the requirements for extended public review of new or expanded ACEC designations, the BLM suggested to commenters that these proposals be re-submitted after finalization of the Butte RMP and that they would be considered as potential RMP amendments in the future if deemed to meet criteria for ACECs.

Moratorium on Land Exchanges

An alternative to place a moratorium on land exchanges was considered but eliminated from detailed study. Congress, through the passage of the Federal Land Policy and Management Act (43 U.S. C.1716), has determined that land exchanges are an appropriate land management tool to consolidate land ownership for more efficient management as long as individual exchanges are determined to be in the public interest and are done within regulatory constraints. **Appendix L – Lands** includes criteria that would be used in evaluating potential land parcels involved with land exchanges.

Reduced Livestock Grazing

An alternative to substantially reduce the number of AUMs in some BLM grazing allotments (excluding allotments acquired through recent land acquisitions and exchanges) was considered as a means to minimize conflicts between livestock grazing and recreational users and wildlife. This alternative was not analyzed in detail because across all alternatives individual allotments would be assessed and managed through implementation of Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

Adjustments to livestock management practices or livestock numbers, including increases or decreases, would be made in accordance with the results of rangeland health assessments, monitoring studies, and allotment evaluations and interdisciplinary review. (These decisions are activity plan or implementation level decisions.)

More Open Roads/Fewer Open Roads

During the public comment period for the Draft RMP/EIS, public comments were received suggesting development of additional travel management alternatives that provided for more open roads for motorized access. In contrast, comments were also received suggesting alternatives for fewer open roads to reduce motorized access and promote more greatly improved natural resource conditions. The BLM reviewed the travel management alternatives in the Draft RMP/EIS. After this review, the BLM believes that the process it followed (described in **Appendix A**) meets the direction described at 43 CFR 8342 for travel planning. While the Preferred Alternative for three travel planning areas was slightly modified, the BLM believes that a reasonable range of alternatives has been provided in this RMP and that additional travel management alternatives are not warranted.

Accelerated Timber Management

During the public comment period for the Draft RMP/EIS, an alternative was suggested to accelerate timber management to remove dead and dying trees from forests and woodlands to a greater degree than what the BLM has proposed in any of its existing alternatives. In considering the specifics of the proposed alternative, the BLM determined that proposed treatment acres identified in existing alternatives would treat three to four times the acreage presumed in the comment. Given the greater degree of treatment in existing RMP alternatives than presumed in the proposal for the additional alternative, combined with the fact that an alternative that promotes the production of timber over other resources would conflict with the multiple use mandates of FLPMA, the BLM believes that an additional alternative is not warranted.

COMPARISON OF ALTERNATIVES

Table 2-23 presents a comparison of the main concepts which comprise the alternatives and the numerical contrast between alternatives in terms of acres affected by the various management prescriptions. This table is organized by issue and management concern as presented in Chapter 2.

COMPARISON OF IMPACTS

The environmental impacts of the alternatives can be compared by examining the key components described in **Table 2-24**. Chapter 4, Environmental Consequences includes a detailed description of the probable outcomes.

Table 2-23
Comparison of Alternatives

ISSU

General Management

GENERAL APPROACH TO VEGETATION MANAGEMENT ACTIVITIES

Goals

- Maintain and/or improve ecological health of woodland communities for sustainability and diversity.
- Manage dry forest types to contain healthy stands of site-appropriate species.
- Manage moist forest types to contain healthy stands that combine into a diversity of age classes and structure.
- Manage old growth forest structures in a sustainable manner.
- Minimize infestations of invasive plants and noxious weeds.
- Manage upland vegetation communities by including a full range of herbaceous and shrub species.
- Maintain or enhance communities of priority habitats to provide desired ecological functions and values.
- Manage riparian and wetland communities for the appropriate composition, density and age structure.
- Manage wetland and riparian habitats to support healthy, diverse and abundant populations of fish and associated aquatic and riparian dependent species.

Management Common to All Alternatives

- Treatments in dry forest types (Douglas-fir, ponderosa pine, interspersed with limber pine) would be designed to mimic pre-fire suppression conditions.
- Emphasis would be on mechanical or hand thinning treatments in Wildland Urban Interface (WUI) areas.
- Outside WUI areas prescribed burning would be emphasized except when not economically feasible or if effects could be detrimental to vegetation or soils.
- Treatments in cool, moist forest types (Douglas-fir, lodgepole pine, subalpine fir, and spruce) would be focused on reducing stem densities and creating appropriate openings to mimic pre-fire suppression conditions.
- In lodgepole pine stands, mechanical treatments (including timber harvest) would be used to create openings to mimic stand-replacing fire events and to regenerate lodgepole pine.
- Grassland and shrubland habitats would be treated to remove conifers that have encroached into these areas in part due to fire suppression.
- Riparian vegetation would be treated to re-establish pre-fire suppression conifer stem densities and distribution. In areas of aspen this would include removing conifers.

Table 2-23
Comparison of Alternatives

VEGETATION MANAGEMENT TOOLS

Management Common to All Alternatives

- Mechanical treatments including thinning small and large diameter sized trees, chipping, grinding, or piling non-commercial sized trees would be used to restore vegetative conditions as needed in all vegetation types.
- Prescribed burning would be used to eliminate conifer encroachment and stimulate vegetative regrowth in grassland/shrubland habitats; and to reduce fuels, thin understories, recycle nutrients, and create small openings in forested vegetation types.
- Noxious weed treatments would include hand-pulling, chemical spray, biological treatments, cultural treatments, and public outreach.

Grasslands and Shrublands – Priority Treatment Areas

Management Common to Action Alternatives (B, C, and D)

- Sagebrush and grassland distribution and vigor would be restored through vegetative treatments.
- Conifer reduction treatments could result in commercial forest products such as biomass, post and poles, and firewood.
- Up to 850 acres of crested wheatgrass seedlings, agriculture fields and weed infestations in the McMasters and Ward Ranch acquisitions would be converted from non-native vegetation to native vegetation.

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
	Priority treatment areas would include big game winter range, sagebrush, bighorn sheep habitat, and the Wildland Urban Interface.	Priority treatment areas would include big game winter range, Wildland Urban Interface, and current sage grouse habitat.	Priority treatment areas would include big game winter range, Wildland Urban Interface, current and historic sagebrush habitat, forest meadows and parks, and bighorn sheep habitat.

Grasslands Objectives - Proposed Range of Grassland Treatment Acres Per Decade by Major Watershed

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Big Hole - N/A	Big Hole -500 to 2,500 (of 16,344)	Big Hole - 100 to 250 (of 16,344)	Big Hole - 1,000 to 3,500 (of 16,344)
Blackfoot - N/A	Blackfoot - 0 to 50 (of <100)	Blackfoot – 0 (of <100)	Blackfoot - 0 to 100 (of <100)
Gallatin - N/A	Gallatin - 0 to 200 (of 860)	Gallatin – 0 (of 860)	Gallatin - 0 to 400 (of 860)
Jefferson - N/A	Jefferson - 500 to 3,000 (of 39,720)	Jefferson - 400 to 500 (of 39,720)	Jefferson - 1,000 to 6,000 (of 39,720)
Missouri - N/A	Missouri - 1,750 to 6,000 (of 73,965)	Missouri - 750 to 1,250 (of 73,965)	Missouri - 3,500 to 9,000 (of 73,965)
Yellowstone - N/A	Yellowstone - 0 to 50 (of 4,409)	Yellowstone – 0 (of 4,409)	Yellowstone - 0 to 50 (of 4,409)
Total - 5,250 (of 135,398)	Total - 2,750 to 11,800 (of 135,398)	Total - 1,250 to 2,000 (of 135,398)	Total - 5,500 to 19,050 (of 135,398)

Table 2-23
Comparison of Alternatives

Grasslands and Shrublands continued

Shrublands Objectives - Proposed Range of Shrubland Treatment Acres Per Decade by Major Watershed

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Big Hole -N/A	Big Hole -550 to 2,000 (of 12,126)	Big Hole -150 to 450 (of 12,126)	Big Hole -1,100 to 4,000 (of 12,126)
Blackfoot - N/A (of < 100)	Blackfoot - 0 to 50 (of < 100)	Blackfoot – 0 (of < 100)	Blackfoot - 0 to 100 (of < 100)
Gallatin - N/A	Gallatin - 0 to 50 (of < 100)	Gallatin – 0 (of < 100)	Gallatin - 0 to 100 (of < 100)
Jefferson - N/A	Jefferson - 300 to 1,000 (of 5,452)	Jefferson - 75 to 200 (of 5,452)	Jefferson - 600 to 1,500 (of 5,452)
Missouri - N/A	Missouri - 150 to 500 (of 1,714)	Missouri - 25 to 100 (of 1,714)	Missouri - 150 to 1,000 (of 1,714)
Yellowstone - N/A	Yellowstone - 0 to 50 (of 366)	Yellowstone – 0 (of 366)	Yellowstone - 0 to 100 (of 366)
Total – 0 (of 19,858)	Total - 1,000 to 3,650 (of 19,858)	Total - 250 to 750 (of 19,858)	Total - 1,850 to 6,800 (of 19,858)

Grasslands and Shrublands - Revegetation Seed Mix

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Native Seed Mixture Unless Modified Through NEPA	Native or low impact, non-invasive seed mixtures would be used to restore vegetation on disturbed ground.	Only native seed species would be used to restore vegetation on disturbed ground.	Same as Alternative B.

Forests and Woodlands

Goals

- Restore and/or maintain the health and productivity of public forests, to provide a balance of forest and woodland resource benefits to present and future generations.
- Manage forestry resources to provide a sustained flow of local economic benefits and protect non-market economic values.

Management Common to All Alternatives

- Vegetation structure, density, species composition, patch size, pattern, and distribution would be managed in a manner to reduce the occurrence of unnaturally large and severe wildland fires and forest insect outbreaks.
- Stands with characteristics indicating a substantial risk of developing epidemic levels of forest insects and/or disease would be high priority for treatments to reduce risk.
- BLM would continue to provide personal use firewood and Christmas tree cutting permits offered cooperatively with the Forest Service, valid for wood collection from BLM and National Forest lands.
- Salvage of forest products resulting from wildland fire, prescribed fire, forest insects, and disease, weather induced or other forest mortality events would be considered.
- Timber salvage project areas would consist of small openings, thinning between openings, and retention patches. In the event of large-scale disturbances, patches of dead and dying forest would be maintained for wildlife dependent upon this type of habitat.

- In all areas with dead and dying trees, tree cutting would be allowed to provide for human safety, fire rehabilitation, and forest or stream restoration activities.
- Tractor logging would generally be limited to slopes with average gradients of less than 40 percent and the season of logging would be limited to reduce soil compaction and rutting.
- Mechanical treatments would be laid out to minimize risk of windthrow, and shelterwood harvests would be made to improve genetic composition of regenerated stands.
- Whenever possible, openings larger than 20 acres resulting from forest treatments or disturbance events would be planted when natural regeneration does not occur at desired levels within 15 years or cannot be reasonably expected in 5 to 15 years.

Management Common to Action Alternatives (B, C, and D)

- Natural disturbance regimes would be maintained or mimicked so that plant communities are resilient when periodic outbreaks of insects, disease, and wildland fire occur.
- Vegetation manipulation projects would be designed to minimize impacts to wildlife habitat and improve it when possible.
- Forest management would emphasize old forest structures, snag management, and large diameter trees for cavity nesters where appropriate.
- The BLM would strive to maintain and/or restore stands with old forest structure within historic range of variability to maintain and/or enhance habitat for old growth dependent species.
- BLM would design fire restoration/rehabilitation standards on a case-by-case basis, compatible with landscape resource management objectives and long-term (25-year) vegetation health protection and fuels management.

FOREST PRODUCTS

- In all action alternatives, commercial harvest of forest products would normally be associated with vegetative restoration (including forest health) and fuels treatments and would be designed to meet objectives for forest management, wildlife habitat management, fire hazard reduction, hazard tree removal, special status species management, visuals, recreation, and travel management.
- Special forest and range products would be managed according to sustainability limits and where consistent with other resource management objectives.
- Residual stands left by disturbance events would be maintained to provide for natural regeneration and diversity of forest systems.
- Firewood cutting would not be allowed in WSAs.

Forests and Woodlands (Dry Forest) Objectives – Proposed Range of Dry Forest Treatment Acres Per Decade by Major Watershed

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Big Hole - N/A	Big Hole - 1,150 to 2,500 (of 19,905)	Big Hole - 250 to 650 (of 19,905)	Big Hole - 2,000 to 3,500 (of 19,905)
Blackfoot - N/A	Blackfoot - 0 to 100 (of 368)	Blackfoot – 0 (of 368)	Blackfoot - 0 to 200 (of 368)
Gallatin - N/A	Gallatin - 0 to 150 (of 533)	Gallatin – 0 (of 533)	Gallatin - 0 to 300 (of 533)
Jefferson - N/A	Jefferson - 1,000 to 4,000 (of 31,936)	Jefferson - 650 to 1,450 (of 31,936)	Jefferson - 2,000 to 5,000 (of 31,936)
Missouri - N/A	Missouri - 1,900 to 7,000 (of 59,988)	Missouri - 1,150 to 2,700 (of 59,988)	Missouri - 3,000 to 7,700 (of 59,988)
Yellowstone - N/A	Yellowstone - 100 to 1,000 (of 2,196)	Yellowstone – 0 (of 2,196)	Yellowstone - 300 to 1,500 (of 2,196)
Total - 5,100 (of 114,926)	Total - 4,150 to 14,750 (of 114,926)	Total - 2,050 to 4,800 (of 114,926)	Total - 7,300 to 18,200 (of 114,926)

Table 2-23
Comparison of Alternatives

Forests and Woodlands (Cool, Moist Forest) Objectives - Proposed Range of Cool, Moist Forest Treatment Acres Per Decade by Major Watershed			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Big Hole - N/A	Big Hole - 200 to 1,600 (of 9,868)	Big Hole - 20 to 200 (of 9,868)	Big Hole - 400 to 1,800 (of 9,868)
Blackfoot - N/A	Blackfoot - 0 to 100 (of <500)	Blackfoot – 0 (of <500)	Blackfoot - 0 to 150 (of <500)
Gallatin - N/A	Gallatin - 0 to 50 (of <100)	Gallatin – 0 (of <100)	Gallatin - 0 to 100 (of <100)
Jefferson - N/A	Jefferson - 50 to 300 (of 2,059)	Jefferson - 5 to 50 (of 2,059)	Jefferson - 50 to 500 (of 2,059)
Missouri - N/A	Missouri - 200 to 1,600 (of 7,165)	Missouri - 20 to 275 (of 7,165)	Missouri - 500 to 2,300 (of 7,165)
Yellowstone - N/A	Yellowstone - 0 to 100 (of 551)	Yellowstone - 5 to 25 (of 551)	Yellowstone - 50 to 200 (of 551)
Total - 2,400 (of 20,243)	Total - 450 to 3,750(of 20,243)	Total - 50 to 550 (of 20,243)	Total - 1,000 to 5,050 (of 20,243)
Forests and Woodlands (Forest Products Objectives) - Probable Sale Quantity			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Probable Sale Quantity would be 12 to 27 MMBF (40,000 to 97,000 CCF) per decade.	Probable Sale Quantity would be 9 to 25 MMBF (33,000 to 91,000 CCF) per decade.	Probable Sale Quantity would be 5 to 12 MMBF (19,000 to 41,000 CCF) per decade.	Probable Sale Quantity would be 10 to 30 MMBF (36,000 to 107,000 CCF) per decade.
Forests and Woodlands (Forest Products) - Small Sales			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
The following permit types and estimated quantities would be anticipated to be permitted per decade under the small sales program: • 350 Permits: • 4,500 Christmas Trees • 750 Cords Firewood • 1,650 MBF Sawtimber (Included with PSQ) • 55 CCF Post, poles, biomass, other woody materials	The following permit types and estimated quantities would be anticipated to be permitted per decade under the small sales program: • 450 Permits: • 5,500 Christmas Trees • 1,000 Cords Firewood • 2,100 MBF Sawtimber (Included with PSQ) • 77 CCF Post, poles, biomass, other woody materials	The following permit types and estimated quantities would be anticipated to be permitted per decade under the small sales program: • 150 Permits: • 4,500 Christmas Trees • 50 Cords Firewood • 500 MBF Sawtimber (Included with PSQ) • 55 CCF Post, poles, biomass, other woody materials	The following permit types and estimated quantities would be anticipated to be permitted per decade under the small sales program: • 600 Permits: • 9,000 Christmas Trees • 1,500 Cords Firewood • 5,200 MBF Sawtimber (Included with PSQ) • 105 CCF Post, poles, biomass, other woody materials

Table 2-23
Comparison of Alternatives

Forests and Woodlands (Forest Products) - Small Sales/Firewood Cutting

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Removal of dead, down, or green trees for firewood could be allowed.	Unless specifically designated, standing dead or down wood may be taken as firewood. At times, BLM could designate specific areas for firewood cutting of live trees to meet other resource objectives.	No standing dead trees or down wood would be allowed to be removed for firewood unless authorized in designated areas. Live trees could be removed for firewood in designated locations, and the joint firewood permit system used by BLM and the USDA Forest Service could not be used.	Same as Alternative B.
No diameter limits for firewood cutting are prescribed.	No dead trees > 24" DBH would be allowed to be taken as firewood.	No live trees >20" DBH would be allowed to be taken as firewood.	Same as Alternative B.
No related action.	Firewood cutting would not be allowed within 100' of live (year-long flow) streams. Firewood cutting would not be allowed within 50' of intermittent streams.	Firewood cutting would not be allowed within 200' of live (year-long flow) streams. Firewood cutting would not be allowed within 100' of intermittent streams.	Firewood would not be allowed to be cut within 100 feet of live (yearlong flow) streams or within 50 feet of intermittent streams or within the Streamside Management Zone, whichever width is greatest.

Forests and Woodlands (Forest Products) - Timber Salvage

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Salvage may proceed without prescriptive restrictions for species dependant on dead and dying forests or species dependant on down woody materials, but will continue to be subject to other restrictions, resource protections or special management considerations required for all forest management activities under Alternative A.	When salvage is proposed in dead and dying forests, contiguous acres of undisturbed standing and down woody material would be retained in adequate amounts for those wildlife species that depend on this type of habitat. Outside of the contiguous areas identified for retention, harvest treatments may include: 1) forest openings appropriate for the site and retention patches of uncut dead and dying trees; or 2) forest openings appropriate for the site with selective thinning between openings and retention patches of uncut dead and dying trees; or 3) selective thinning and retention patches of uncut dead and dying trees.	Where contiguous acres of dead and dying forest exceed 1,000 acres, 50 percent of the area would be maintained as retention. Harvest treatments within the remaining project area may include: 1) creation of forest openings, 2) selective thinning between openings and 3) 50 percent total retention across the harvest treatment area.	Where contiguous acres of dead and dying forest exceed 1,000 acres, 30 percent of the area would be maintained as retention. Harvest treatments within the remaining project area may include: 1) creation of forest openings, 2) selective thinning between openings, and 3) no retention requirements within harvest treatment area.

Table 2-23
Comparison of Alternatives

Forests and Woodlands (Forest Products) - Road Access

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Roads would be constructed to the minimum standards necessary to remove the timber, unless the roads would be needed for other public purposes requiring a higher standard. If needed, up to 5.5 miles of new permanent roads could be constructed per year to provide access for treatments.	Some new permanent roads may be built for long-term management of areas where multiple entries would be necessary to meet objectives. New road construction would be kept to a minimum. Temporary road construction would also be kept to a minimum, and temporary roads would be decommissioned within one year of project completion. Refer to temporary roads definition in glossary.	Forest treatments would occur in areas already accessible by the current road system. No new permanent roads would be constructed. Temporary road construction would be kept to a minimum. Temporary roads would be decommissioned within 1 year of project completion. Refer to temporary roads definition in glossary.	Some new permanent roads may be built for long-term management of areas where multiple entries would be necessary to meet objectives. New road construction, however, would be kept to a minimum. Some new permanent roads could be left open to the public if travel plan objectives for the area are met. Temporary road construction would be kept to a minimum. Refer to temporary roads definition in glossary.

Riparian Vegetation

Management Common to All Alternatives

- At the Field Office scale, management would restore and improve riparian areas and wetlands. Riparian areas that are functioning at risk would be a high priority for restoration.
- Authorized activities within riparian areas would strive to maintain and restore riparian structure and function, benefit fish and riparian-dependant species, enhance conservation of organisms that depend on the transition zone between upslope and the stream, and maintain or improve the connectivity of travel and dispersal corridors for terrestrial animals and plants.
- Forested riparian habitats would be managed to accelerate the development of mature forest communities to promote shade, bank stability, and woody debris recruitment. Late-successional riparian vegetation would be promoted in amounts and distribution similar to historic conditions.
- The Montana Streamside Management Zone law would be followed as a minimum to protect riparian resources.
- Riparian communities, habitat, and associated uplands would be treated and restored through implementation of livestock grazing guidelines to meet Land Health Standards.

Management Common to Action Alternatives (B, C, and D)

- Riparian areas would be managed to provide the amount and distribution of large, woody material characteristic of natural aquatic and riparian ecosystems. Trees may be felled in riparian areas when they pose a safety risk or are needed to enhance riparian function/condition. Felled trees would be kept on site when needed to meet woody debris objectives.
- BLM would cooperate with federal, tribal, and state wildlife management agencies and private landowners to identify activities that prevent meeting riparian standards. In cooperation with those agencies, projects or management measures would be designed to minimize impacts.
- Mechanical or hand cutting and/or prescribed burning would be used to remove competing conifers from riparian ecosystems, including aspen clones. Commodity removal of juniper would be encouraged.

Table 2-23
Comparison of Alternatives

Riparian Vegetation – Riparian Management Zones (RMZs)

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Managed per the Montana Streamside Management Zone Law.	RMZs from the edge of the aquatic habitat would be established as follows: **Forested Areas** <u>Streams, lakes, ponds, and reservoirs containing fish</u>: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel (average high water mark), full pool, or adjacent wetland a distance equal to the height of two site-potential trees. (Site potential tree height – within forested areas would be the average maximum potential height of dominant trees, in the RMZ). <u>Perennial non-fish bearing streams</u>: The RMZ would consist of the stream and a zone located on both sides of the channel. This zone would extend from the outer edges of the bankfull channel (or adjacent wetland) a distance equal to one site-potential tree height. <u>Non-fish bearing ponds, lakes, reservoirs, or wetlands greater than 1 acre</u>: The RMZ would extend from the outer edge of the full pool or wetland a distance equal to one site-potential tree height or to the edge of seasonally saturated soil or wetland vegetation, whichever is greater.	RMZs from the edge of the aquatic habitat would be established as follows: **Forested Areas** <u>Streams, lakes, ponds, and reservoirs containing fish</u>: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel, full pool, or adjacent wetland a distance equal to the top of the inner gorge, or the outer edge of the 100-year floodplain, or 300 feet slope distance, whichever is greatest. <u>Perennial non-fish bearing streams</u>: The RMZ would consist of the stream and a zone located on both sides of the channel. This zone would extend from the outer edges of the bankfull channel (or adjacent wetland) a distance equal to the top of the inner gorge, the outer edge of the 100 year floodplain, or 150 feet slope distance whichever is greatest. <u>Non-fish bearing ponds, lakes, reservoirs, or wetlands greater than 1 acre</u>: The RMZ would extend 150 feet slope distance from the outer edge of the full pool or wetland. This area would also include all moderately and highly unstable areas.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Riparian Vegetation – Riparian Management Zones (RMZs) – continued

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
	Intermittent streams and wetlands less than 1 acre: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend at least 50 feet from the outer edges of the bankfull channel or adjacent wetland. **Non-forested Areas** For fish-bearing and non-fish bearing streams, lakes, ponds, and reservoirs: the RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel (average high-water mark), full pool, or adjacent wetland a distance that encompasses the active floodplain. The RMZ would extend 50 feet above the break in slope leading down from the lowest terrace to the floodplain, or in segments where trees are present, to a distance equal to 1 site-potential tree height from the edge of the feature, whichever is greatest. Intermittent streams and wetlands less than 1 acre: RMZs would be 50 feet from the edge of wetland vegetation or active stream channel as indicated by riparian vegetation, saturated soil, or water. The criteria for selecting the width may be different for each side of the water body.	Intermittent streams and wetlands less than 1 acre: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend at least 50 feet slope distance from the outer edges of the bankfull channel or wetland. **Non-forested Areas** Perennial fish-bearing and non fish-bearing streams or wetlands larger than 1 acre: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend from the outer edges of the bankfull channel, full pool, or adjacent wetland a distance that encompasses the active floodplain. RMZs would extend 150 feet above the break in slope leading down from the lowest terrace to the floodplain. Intermittent streams and wetlands less than 1 acre: The RMZ would consist of the water body and a zone located on all sides of the water body. This zone would extend at least 50 feet from the outer edges of the bankfull channel or wetland.	

Table 2-23
Comparison of Alternatives

Riparian Vegetation Objectives - Proposed Range of Riparian Vegetation Treatment Acres Per Decade by Major Watershed			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Big Hole - N/A	Big Hole - 50 to 200 (of 3,139)	Big Hole - 20 to 50 (of 3,139)	Big Hole - 75 to 650 (of 3,139)
Blackfoot - N/A	Blackfoot - 0 to 40 (of 92)	Blackfoot – 0 (of 92)	Blackfoot - 0 to 40 (of 92)
Gallatin - N/A	Gallatin - 0 to 10 (of 22)	Gallatin – 0 (of 22)	Gallatin - 0 to 10 (of 22)
Jefferson - N/A	Jefferson - 50 to 200 (of 2,846)	Jefferson - 20 to 50 (of 2,846)	Jefferson - 75 to 300 (of 2,846)
Missouri - N/A	Missouri - 100 to 200 (of 4,651)	Missouri - 35 to 100 (of 4,651)	Missouri - 150 to 600 (of 4,651)
Yellowstone - N/A	Yellowstone - 0 to 50 (of 350)	Yellowstone – 0 (of 350)	Yellowstone - 0 to 100 (of 350)
Total – 30 (of 11,100)	Total - 200 to 700 (of 11,100)	Total - 75 to 200 (of 11,100)	Total - 300 to 1,700 (of 11,100)
Note: Treatment acres are by mechanical and prescribed burning methods. For Alternative A, this treatment figure is a continuation of what has occurred; however, the current plan allows treatment in all riparian areas subject to other management constraints.			
Riparian Vegetation – Aspen			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related action.	Where the primary project objective is aspen restoration, treated aspen stands would be fenced from livestock and wildlife when recovery could be suppressed by grazing and browsing. Fencing could consist of using native, on-site materials as barriers.	The structure and composition of aspen stands would be determined by natural processes or treated opportunistically through other projects. Treated aspen stands would be fenced from livestock grazing and, if necessary, wildlife grazing, and browsing. There would be an emphasis on using native, on-site materials for "natural" barriers.	Same as Alternative B.
Livestock Grazing			
Goals • Manage for a sustainable level of livestock grazing while meeting or progressing toward Land Health Standards. • Maintain, restore, or enhance BLM rangelands to meet the Land Health Standards. • Manage livestock grazing to provide a sustained flow of local economic benefits and protect non-market economic values.			

Table 2-23
Comparison of Alternatives

Livestock Grazing continued

Management Common to All Alternatives

- Livestock grazing would be managed through Implementation of Standards for Rangeland Health and Guidelines for Livestock Grazing.
- Cooperatively managed allotments with the USFS and Dillon Field Office would continue under existing Memoranda of Understanding. Applications for unleased allotments and vacant available lands would be considered on a case-by-case basis.
- Adjustments to livestock management practices or livestock numbers would be made based on results of monitoring studies, rangeland health assessments, allotment evaluations, and interdisciplinary review.
- Functional wildlife escape ramps would be installed and maintained on all water tanks on BLM lands.
- Grazing practices in riparian areas that retard or prevent attainment of riparian goals or proper functioning condition would be modified.
- New fences would be built to standard BLM wildlife specifications to allow wildlife passage
- Livestock grazing guidelines for residual cover and monitoring of forage utilization in new or revised Allotment Management Plans would be developed.
- No new term grazing permits would be authorized on river islands.
- Water developments for livestock generally would not be established in areas where significant conflicts with wildlife forage and habitat occur.
- Sufficient forage and cover would be provided for wildlife on seasonal habitat.

Management Common to Action Alternatives (B, C, and D)

- For allotments without specific management objectives, the utilization level as measured at the end of the grazing season would not exceed 55 percent on non-native seedlings and 45 percent on native herbaceous forage plants.
- Grazing uses on lands proposed for acquisition would be considered on a case-by-case basis based on the values identified for the acquisition.
- No new kind of livestock conversions from sheep or cattle to horses would be allowed on existing allotments smaller than 160 acres.
- BLM would develop and implement appropriate grazing strategies in grizzly bear distribution zones.

Livestock Grazing – Allowable Use

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Livestock grazing would be allowed on about 278,000 acres. The amount of forage available on these lands would be 25,677 Animal Unit Months (AUMs).	Livestock grazing would be allowed on about 270,000 acres of public land. The amount of forage available on these lands would be 24,710 AUMs active use and 1,312 AUMs forage reserve, temporary non-renewable AUMs.	Livestock grazing would be allowed on about 262,000 acres of public land. The amount of forage available on these lands would be 24,710 AUMs active use and 936 AUMs forage reserve, temporary non-renewable AUMs.	Same As Alternative A

Table 2-23
Comparison of Alternatives

Livestock Grazing - McMasters/Spokane Hills Areas			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would become vacant and available to qualified applicants per the grazing regulations. These allotments would be administered like all other existing allotments.	After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would become forage reserve allotments. Use would be authorized on a temporary, nonrenewable basis.	Same as Alternative B.	Same as Alternative A.
Livestock Grazing - Indian Creek/Iron Mask Areas			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
The existing Indian Creek allotment (2,215 acres and 376 AUMS) would be expanded up to an additional 5,566 acres and 700 AUMS by the Iron Mask acquisition. The Indian Creek allotment would be available to qualified applicants per the grazing regulations. This allotment would be administered like all other existing allotments.	The existing Indian Creek allotment would be expanded up to 5,566 additional acres and 700 AUMS by the Iron Mask acquisition. The allotment would be managed as a forage reserve allotment. Use would be authorized on a temporary, nonrenewable basis.	The existing Indian Creek allotment (2,215 acres and 376 AUMS) as well as any lands acquired from the Iron Mask acquisition would be unavailable for grazing lease or permit.	Same as Alternative A.
Livestock Grazing – Centennial Gulch Area			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
The Medicine Rock riparian areas would not be available for prescription livestock grazing. The Centennial Gulch (Ward Ranch) allotment would be available to qualified applicants per the grazing regulations.	The Centennial Gulch (Ward Ranch) allotment and Medicine Rock (Northeast Helena) riparian area would only be available for prescription livestock grazing to meet specific resource objectives.	Same as Alternative B.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Livestock Grazing – Relinquished Allotments

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Allotments where grazing preference is relinquished would remain available for livestock grazing leases or permits.	After the current permittee ceases livestock grazing, the McMaster Hills and Spokane Hills individual allotments would be established as forage reserve allotments (an allotment without a term grazing permit that is grazed on a temporary nonrenewable basis. This type of allotment would be used to provide temporary grazing to rest other areas following wildfire, habitat treatments, or to allow for more rapid attainment of rangeland health). Forage reserve allotments would be managed to meet, or move toward meeting, land health standards. Use would be authorized on a temporary, nonrenewable basis. The amount of use would be determined by the BFO. Applicants would be required to meet qualifications per the grazing regulations, and show the ability and commitment to repair and maintain improvements and infrastructure. The BFO would rank qualified applicants according to the following criteria in priority order: 1. Implementing projects or vegetation management on BLM lands. 2. Facilitating a change in management to improve resource conditions on BLM allotments. 3. Accommodating permittees or lessees displaced by natural causes (i.e. wildland fire, drought, insect infestations, etc.) The criteria found at 43 CFR §4130.1-2 (USDI-BLM 2006a) when conflicting applications are submitted.	Same as Alternative B.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Livestock Grazing – Rest from Grazing Before Prescribed Burning			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Rest from livestock grazing in areas identified for prescribed burning would be determined through site-specific interdisciplinary planning and NEPA processes.	Areas identified for prescribed burning would be rested from livestock grazing up to one year prior to treatment if necessary to produce fine fuels to carry the burn, and for a minimum of two growing seasons following treatment to promote recovery of vegetation. Livestock rest for more or less than two growing seasons could be justified on a case-by-case basis.	Areas identified for prescribed burning would be rested from livestock grazing up to one year prior to treatment if necessary to produce fine fuels to carry the burn, and for a minimum of two growing seasons following treatment to promote recovery of vegetation.	Areas identified for prescribed burning would be rested from livestock grazing prior to treatment if necessary to produce fine fuels to carry the burn, and for a minimum of one growing season following treatment to promote recovery of vegetation. Livestock rest for more than one growing season could be justified on a case-by-case basis.
Livestock Grazing – Adjustments			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Forage and cover requirements would be incorporated into allotment management plans and would be specific to areas of primary wildlife use.	Grazing practices would be adjusted to protect or enhance fish and wildlife habitat when livestock grazing is a contributing factor to not meeting land health standards.	Guidelines for residual ground cover would be developed in Allotment Management Plans. Forage utilization would be monitored.	Same as Alternative B.
Livestock Grazing - Exclosures			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related action.	Range projects would be maintained as long as needed to meet management objectives. Maintenance would be assigned to grazing permittees, other authorized public land users, or the BLM. Routine maintenance would be completed according to the maintenance schedule per the terms and conditions of existing cooperative agreements.	Currently existing exclosures would be maintained free from livestock grazing. Exclosures would be maintained annually before livestock turnout and would be monitored to compare differences between grazed and ungrazed areas.	Currently existing exclosures would be maintained free from livestock grazing. Exclosures would be checked and maintained every five years.

Table 2-23
Comparison of Alternatives

Livestock Grazing - Bighorn Sheep

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Existing Instruction Memorandum 98-140 (USDI-BLM 1998b) would be followed to protect wild sheep.	No change in livestock conversions from cattle to domestic sheep or goats would be allowed in allotments within occupied wild sheep habitat. New sheep and goat allotments or conversions from cattle to sheep or goats would be permitted a minimum of 5 miles from known bighorn sheep habitat. This distance would be greater if deemed necessary through site-specific analysis. Goats and sheep could be used for weed control on winter ranges when wild sheep are absent. To minimize contact with bighorn sheep, domestic sheep and goats used for weed control would only be allowed to graze for up to 1 month near occupied bighorn sheep habitat and there would be a minimum buffer of 2 miles between domestic and wild sheep. Bedding grounds would be at least 4 miles from known bighorn sheep habitat. The use of domestic sheep and goats would only be allowed from 5/1 to 7/31, unless coordinated with MFWP. A herder would be required to be on site at all times and be able to communicate with the BLM, the herd owner and MFWP. If bighorn sheep and domestic sheep and goats come into contact, the herder would be required to contact the BLM and MFWP immediately.	No change in livestock conversions from cattle to domestic sheep or goats would be allowed in allotments within occupied wild sheep habitat. New sheep and goat allotments or conversions from cattle to sheep or goats would be permitted a minimum of 9 miles from known bighorn sheep habitat. This distance would be greater if deemed necessary through site specific analysis. Goats and sheep could be used for weed control on winter ranges when wild sheep are absent. To minimize contact with bighorn sheep, domestic sheep and goats used for weed control would only be allowed to graze for up to two weeks near occupied bighorn sheep habitat and there would be a minimum buffer of 4 miles between domestic and wild sheep. Bedding grounds would be at least 6 miles from known bighorn sheep habitat. The use of domestic sheep and goats would only be allowed from 5/15 to 7/15 unless coordinated with MFWP. A herder would be required to be on site at all times and be able to communicate with the BLM, the herd owner and MFWP. If bighorn sheep and domestic sheep and goats come into contact, the herder would be required to contact the BLM and MFWP immediately.	The existing Instruction Memorandum 98-140 (USDI-BLM 1998b) would be followed to protect wild sheep. Goats and sheep could be used for weed control on winter ranges when wild sheep are absent. To minimize contact with bighorn sheep, domestic sheep and goats used for weed control would only be allowed to graze for up to 1 month near occupied bighorn sheep habitat and there would be a minimum buffer of 2 miles between domestic and wild sheep. Bedding grounds would be at least 4 miles from known bighorn sheep habitat. The use of domestic sheep and goats would only be allowed from 5/1 to 7/31 unless coordinated with MFWP. A herder would be required to be on site at all times and be able to communicate with the BLM, the herd owner and MFWP. If bighorn sheep and domestic sheep and goats come into contact, the herder would be required to contact the BLM and MFWP immediately.

Wildland Fire Management

Goals

- Provide an appropriate management response to all wildland fires, emphasizing firefighter and public safety.
- Move toward restoring and maintaining desired ecological conditions consistent with appropriate fire regimes.
- Minimize the adverse effects of fire on resources, resource uses, and wildland-urban interface.
- Promote seamless fire management planning across jurisdictions within the boundaries of the BFO.
- Protect life and property by treating hazardous fuels on BLM lands near Wildland Urban Interface.

Management Common to All Alternatives

- The Beaverhead-Deerlodge National Forest, Helena National Forest, Gallatin National Forest, and the State of Montana DNRC would implement fire preparedness, prevention, and suppression on BLM administered lands through the interagency offset and six party fire protection agreements.
- Use of retardant in Wilderness Areas or WSAs would be avoided and would require line officer approval.
- Use of heavy equipment would be restricted to areas outside of Wilderness or WSAs.
- Minimum Impact Suppression Tactics would be used when working in a Wilderness Area or WSAs, following the Interim Management Policy and Guidelines for Lands under Wilderness Review (BLM Handbook H-8550-1). BLM would manage naturally ignited wildland fires in the Elkhorn Mountain units under the prescription guidelines established in the Elkhorn Mountains Fire Management Plan.
- Fire Management activities (wildland fire, fuels, and fire mitigation, education and prevention) would be prioritized by their risk of life and property across the Planning Area. Fires that are adjacent to or near WUI would have highest priority for fire suppression.
- Fire management activities would be designed and implemented in a manner that meets, or moves toward meeting Land Health Standards. Wildland fire management activities would be conducted to meet or move toward meeting Land Health Standards when compliant with the standards for fire operations.
- Emergency fire rehabilitation funds may be used to:
    a. Protect life, property, and soil, water and vegetation resources.
    b. Prevent unacceptable onsite or offsite damage.
    c. Facilitate meeting land use plan goals and other federal laws.
    d. Reduce the invasion and establishment of undesirable or invasive vegetation.
- Incident bases, camps, helibases, staging areas, and other incident management activities would be located outside of riparian areas. If unavoidable, an exemption could be made by a resource advisor.
- BLM would implement management actions that maintain or move plant communities to the historic fire regime and condition classes. In areas where the environment has changed substantially and a return to historic conditions is not possible or ecologically desirable, the appropriate fire regime would be determined based on current management.
- BLM would provide assistance to communities in developing and maintaining community wildland fire protection plans.

Table 2-23
Comparison of Alternatives

Wildland Fire Management - continued

Management Common to Action Alternatives (B, C, and D)

- Priority of fire management activities would be placed on fuels reduction in WUI areas in conjunction with completed Community Wildfire Protection Plans.
- Fire management activities outside of the WUI areas would use Fire Regime, Condition Class (FRCC) to determine level of fuels treatments.
- Fire management would focus on maintaining fire dependent ecosystems and restoring or maintaining those areas outside their natural balance through mechanical, chemical, and/or prescribed fire treatments.
- Spread of non-native invasive aquatic species as well as additional resource values would be addressed in the Butte Field Office Fire Management Plan to be revised after finalization of this RMP.

Fire Management Response

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
The BLM administered ground is currently is managed under A, B, and C FMU designations (for description of FMU designations see Chapter 2). Approximately 7,300 acres would be designated in an A FMU, 36,700 acres would be designated in a B FMU, and 258,200 acres would be designated in a C FMU.	BLM administered ground would be managed under B and C FMU designations (for description of FMU designations see Chapter 2) based on watersheds. No acres would be designated in an A FMU, 52,000 acres would be designated in a B FMU, and 255,000 acres would be designated in a C FMU.	BLM administered ground would be managed under A, B and C FMU designations (for description of FMU designations see Chapter 2) based on watersheds. Approximately 41,000 acres would be designated in an A FMU, 23,000 acres would be designated in a B FMU, and 243,000 acres would be designated in a C FMU.	BLM administered ground would be managed under B, C, and D FMU designations (for description of FMU designations see Chapter 2) based on watersheds. No acres would be designated in an A FMU, 42,000acres would be designated in a B FMU, 82,000 acres would be designated in a C FMU, and 183,000 acres would be designated in a D FMU.

Fire - Timing Periods

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Management-ignited prescribed fire would not be conducted between May 1 and August 30 to protect nesting migratory birds, unless breeding bird surveys document low potential impacts to breeding birds.	Vegetation treatments, including management-ignited prescribed fire and mechanical treatments would not be conducted between May 1 and August 30 to protect nesting migratory birds, unless breeding bird surveys document low potential impacts to breeding birds.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Fire - Habitat w/in Burn Patches

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	In grassland/shrubland habitats, BLM would plan for prescribed burns that do not consume above-ground vegetation on more than 80 percent (on average) of each unit by surface area.	In grassland/shrubland habitats, BLM would plan for prescribed burns that do not consume above-ground vegetation on more than 60 percent (on average) of each unit by surface area.	In grassland/shrubland habitats, BLM would plan for prescribed burns that do not consume above-ground vegetation on more than 90 percent (on average) of each unit by surface area.

Fire - Fire Retardant

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Delivery of chemical retardant, foam or additives to live streams would be avoided. Maps of fish bearing streams would be developed for use in initial attack of wildland fires.	Use of chemical retardant foam, or additives over live streams would only occur if there a risk to human life and safety.	Delivery of chemical retardant, foam or additives to live streams would be avoided.

Fire - Fish Screens

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Fish screens (1/8 inch diameter holes) on hoses would be required when removing water from fish bearing streams during fire management activities.	Same as Alternative B.	Same as Alternative A.

Noxious Weeds

Goal

- Minimize infestations of invasive plants and noxious weeds.

Management Common to All Alternatives

- Weed management would utilize Integrated Weed Management and work within federal, state, and county guidelines, laws, statutes, plans, and regulations to minimize infestations of invasive plants and noxious weeds.
- Management would continue to work cooperatively and coordinate with county, state, and federal agencies, weed management areas, and private landowners and organizations.
- Weed management prescriptions would be included in all new treatment projects and incorporated, where possible, into existing contracts, agreements and land use authorizations which would result in ground disturbing activities.
- Weed seed free forage (hay, grains, cubes, pelletized feeds, straw, and mulch) would be used on BLM lands.
- Monitoring would evaluate weed management activities at project and field office levels.
- All weed treatment ranges represent only 10 to 15 percent treatment of new acres. The remainder would be repeat treatments on the same infestations.

Table 2-23
Comparison of Alternatives

Noxious Weeds - continued

Management Common to Action Alternatives (B, C, and D)

- All contractor and BLM equipment would be power washed to remove weed seeds before entering ground disturbing project areas.
- Weed control using domestic sheep and/or goats in occupied bighorn sheep habitat or using biological controls which have been documented to damage existing desired species would be prohibited.
- BLM would conduct outreach and education for BLM personnel, public land users, and the general public.
- BLM would encourage development of weed management areas.
- Plant communities would be restored, where applicable, to promote resistance to weed invasion.

Noxious Weeds Objectives - Proposed Range of Weed Treatment Acres Per Decade

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
20,000	21,000 to 50,000	16,000 to 38,000	25,000 to 61,000

Noxious Weeds - Treatment Focus/Priorities

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Management on roads and trails, urban interface and recreation areas, and areas currently under a multi-year treatment plan. All grazing allotment agreements for the Planning Area would continue to address weed control by chemical treatment and adjusting livestock use.	Prevention on roads, trails, waterways, recreation sites, and disturbed sites due to project implementation. Prevention and control in special designation areas and weed management areas are also high priority.	Prevention on roads, trails, waterways, recreation sites, disturbed sites due to project implementation, and special designation areas. Prevention and control in special designation areas would be a moderate priority.	Prevention on roads, trails, waterways, recreation sites, and disturbed sites due to project implementation. Prevention and control in special designation areas, weed management areas, areas under a multi-year treatment plan would be a moderate priority.

Noxious Weeds - Aerial Spraying

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Aerial spraying of herbicides would not take place within 200 feet of streams or wetlands.	Procedures described in the Record of Decision for Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (U. S. Department of Interior, Bureau of Land Management, June 2007) would be used. All vegetation projects must be consistent with the Standard Operating Procedures and mitigation measures identified in this Record of Decision.	Aerial application of herbicides and pesticides would not occur.	Aerial spraying of herbicides would not take place when eye-level winds are greater than 6 miles per hour or within 100 feet of streams or wetlands.

Noxious Weeds - Special Status Plants			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related action.	BLM, county, and contractor personnel participating in weed treatment activities would be provided with training to identify special status plants and maps of special status plant populations associated with weed treatment areas.	BLM weed personnel would be provided with maps of special status plant populations associated with weed treatment areas.	Same as Alternative B.
Noxious Weeds - Public Outreach			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related action.	Outreach/education on noxious weeds would be provided to the public at campgrounds and trailheads.	Same as Alternative B.	Outreach/education on noxious weeds would be provided to the public at campgrounds, trailheads, to specific user groups, at schools, fairs, and community events.

ISSU

Goals

- Conserve, enhance, restore, mitigate, or contribute to the recovery of threatened, endangered, or candidate plant or animal species.
- Conserve or enhance habitat or mitigate negative effects to habitat of BLM sensitive plant and animal species to prevent the federal listing of these species.
- Conserve special-status species and habitats across the landscape through collaboration and cooperation.
- Provide a variety of well-distributed diverse plant communities to support a diversity of habitats.
- Conserve, enhance, restore, or mitigate areas of important wildlife habitat such as rare or limited seasonal habitats, corridors, blocks of intact functional habitat across the landscape, areas of low road-density, foraging areas, and riparian areas.
- Conserve, enhance or restore special habitat features or mitigate/minimize impacts to special habitat features including, but not limited to caves, cliffs, riparian areas, wetlands, snags, and down woody material.

Management Common to All Alternatives

- All alternatives would emphasize actions that would promote conservation of special status and priority wildlife species and the ecosystems on which they depend. All alternatives would emphasize maintaining and supporting healthy, productive, and diverse populations and communities of native plants and animals (including big game species such as deer, elk, and bighorn sheep) appropriate to soil, climate, and landform.
- Habitat improvement projects would be implemented where necessary to restore wildlife habitat and/or to improve unsatisfactory or declining wildlife habitat.
- Important blocks of hiding, security, and thermal cover for big game would be considered during project planning.

Table 2-23
Comparison of Alternatives

WILD

- All new fences would be built to standard BLM wildlife specifications (USDI – BLM. 1989b. Bureau of Land Management Fencing Handbook, H-1741-1) to allow wildlife passage with the exception of fences built specifically to keep native ungulates out of an area unless site specific analysis indicates other specifications are necessary.
- Consistent with the requirements of the Endangered Species Act (1973) and BLM policy, all alternatives would ensure that actions are consistent with the conservation needs of special status species. The BLM would seek opportunities to conserve and improve special status species habitats and habitats for native plants and wildlife in project level planning and in other BLM authorized, funded, or approved activities.
- BLM would cooperate and collaborate with federal, tribal, and state wildlife management agencies as well as private landowners to improve habitat for wildlife and special status plants.
- Timing restrictions may be used in special status species habitat. Human activities that disrupt special status species habitats during their seasons of use, particularly during the breeding and winter seasons would be avoided or minimized.
- BLM would manage in a manner consistent with current and future restoration/conservation and recovery plans/conservation agreements (westslope and Yellowstone cutthroat trout, Arctic grayling, and prairie dog) for sensitive terrestrial and aquatic species.
- Sage grouse management activities would be designed and implemented to be consistent with adopted conservation strategies such as The National and Montana Management Plan and Conservation Strategies for Sage Grouse in Montana (USDI-BLM 2004) and current, accepted science.
- Vegetation altering activities could occur in sage grouse habitat where it does not result in long-term loss of habitats or contribute to the need to list. Sufficient sagebrush densities and cover would be retained in sage grouse habitat.

Management Common to Action Alternatives (B, C, and D)

- All federally listed and BLM sensitive species and their habitats would be considered priority species and habitats. Additional priority wildlife species would be big game (such as elk, bighorn sheep, deer, and antelope) and migratory birds listed by USFWS and Level 1 and Level 2 species listed under the Montana Bird Conservation Plan (Partners in Flight 2000). Tier I and Tier II habitat and species from Montana's Comprehensive Fish and Wildlife Conservation Strategy (MFWP 2005b) would also be considered priority species and habitats. Priority habitats would include habitat for all special status species as well as riparian areas, dry savannah forest, special habitats including caves, cliffs, snags and down woody material, sagebrush, bitterbrush communities and mountain mahogany communities.
- Management techniques, including but not limited to prescribed and managed wildland fire, prescriptive livestock grazing, planting, exclusion to intense disturbance, timber harvest and other mechanical methods would be used to restore, maintain or improve the desired ecological conditions of vegetation communities for the purpose of improving forage, nesting, breeding, and security habitat, hiding cover and travel corridors for a wide diversity of terrestrial and aquatic species.
- The BLM would emphasize providing habitat of sufficient quantity and quality, including connectivity and wildlife movement corridors, habitat complexity, forest openings, edges, and ecotones, to enhance biological diversity and provide quality, sustainable habitat for native wildlife species.
- BLM would maintain suitable habitat conditions and minimize fragmentation in linkage corridors among habitats occupied by special status species.
- BLM would coordinate with MFWP to determine whether habitat and other conditions exist that would allow successful reintroduction of locally or regionally absent species, such as westslope cutthroat trout, sage grouse, beaver, bighorn sheep, and prairie dogs.

Table 2-23
Comparison of Alternatives

- To the extent possible, BLM would: maintain large patches of high quality sagebrush in occupied or historic sage grouse habitat (as mapped by MFWP); maintain connections between sagebrush habitats and enlarge the size of sagebrush patches in occupied or historic sage grouse habitat.
- BLM would close rock climbing in areas with active raptor nests and would educate the public about the importance of avoiding such locations.
- Seasonal timing restrictions on projects that cause disturbance would be applied where they are needed to minimize the impacts of human activities on important seasonal wildlife habitat. The major types of seasonal wildlife habitat and the time periods which restrictions may be needed are: big game winter and spring range (12/1 to 5/30), big game calving range/habitat (5/1 to 6/30), mountain goat nursery areas (5/1 to 7/15), mountain goat breeding areas (11/1 to 12/31), mountain goat winter range (10/15 to 5/15), grizzly bear spring and summer range (4/1 to 9/1), and grizzly bear denning habitat (10/1 to 4/30).
- One objective under all action alternatives would be to maintain functional blocks of security habitat for big game species across the landscape. Where minimum-size blocks of security habitat (250 acres), as defined by Hillis et al. (1991), are located, they would be retained in a suitable condition during project planning and implementation. Protection of larger blocks of security habitat would also be addressed during project or watershed level planning. Where security habitat is limited or fragmented across the landscape, the BLM would emphasize improving habitat through vegetation treatments and road closures (including seasonal closures) to increase security habitat for big game species.
- At the project level, dead and down woody material would be retained in amounts that are within the range of natural variability for the plant community, to the extent compatible with reforestation objectives, fire hazard reduction standards, and public safety.
- In grasslands and shrublands undergoing vegetation treatments such as the removal of conifer encroachment through mechanical thinning or prescribed burning, all trees and snags with characteristics of old forest structure would be left standing to the extent practicable.
- All action alternatives would emphasize protecting and restoring special habitat components or features that contribute to the productivity of bat species.
- Caves and abandoned mines would be surveyed and assessed for bat use. BLM would determine the need for closures or seasonal closures for activities affecting caves and abandoned mines. Hibernacula closure dates would be approximately 10/15 to 5/1 and maternity closure dates would be approximately 4/15 to 9/30.
- Bat gates or other suitable measures would be used to protect bat habitat when bat use of caves or abandoned mines is determined. Public health and safety would take precedence over protection of bat habitat if hazardous mine openings cannot be remediated with installation of bat gates.
- BLM would comply with the standards and guidelines in the Canada Lynx Conservation Assessment and Strategy (Appendix G).
- BLM would develop and implement human food storage regulations and guidelines in grizzly bear distribution zones in coordination with MFWP and other agencies.
- All action alternatives would emphasize maintaining diverse, healthy, productive, well-distributed aquatic habitats and communities to increase populations of native fish and other aquatic species.
- The BLM would emphasize maintaining and/or restoring the structure, composition, and function of aquatic ecosystems to support a diversity of aquatic plant and animal species and emphasize hydrologic connectivity within watersheds to maintain and/or restore habitat and connectivity needs for populations of aquatic dependent species.
- The BLM would restore and/or maintain riparian structure, composition, and processes, including physical integrity of riparian ecosystems, amount and distribution of woody debris to sustain physical and biological complexity, adequate summer and winter thermal regulation, water quality and hydrologic processes, distribution and diversity of riparian vegetative communities and source habitats for riparian dependent species.

Table 2-23
Comparison of Alternatives

WILD

Management Common to Action Alternatives (B, C, and D) - continued

- BLM would opportunistically enhance or restore populations of and habitat for westslope and Yellowstone cutthroat trout and Arctic grayling.
- In select areas identified for native fish restoration, BLM would collaborate with MFWP to remove non-native fish species that out-compete or hybridize with native cutthroat trout.
- Transportation system effects on fisheries resources would be reduced. To the extent possible, roads would be located, designed and maintained to reduce sedimentation, identify and remove unnatural barriers, eliminate fish passage barriers (when desired), and restore or maintain riparian vegetation.

Wildlife - Livestock Grazing Fences as Barriers

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Fences identified as barriers to wildlife movement would be considered for removal or reconstruction on a case by case basis, to follow BLM fence specifications for wildlife.	Fences identified as barriers to wildlife movement would be removed or reconstructed to follow BLM fence specifications for wildlife.	Same as Alternative B.

Wildlife - Restoration/Fire Rehabilitation

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	For habitat enhancement, fire rehabilitation and other restoration projects, a variety of techniques would be considered to protect plantings, and seedlings from the effects of wildlife and domestic grazing including rest, fencing, netting, and wildlife repellants.	For habitat enhancement, fire rehabilitation and other restoration projects, plantings and seedlings would be protected from the effects of wildlife and domestic grazing including rest, fencing, netting, and wildlife repellants.	Same as Alternative B.

Wildlife Objectives - Big Game and Roads

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Where applicable, the elk management guidelines contained in the Montana Cooperative Elk-logging Study (USDA-FS 1982) will be followed. The existing road network generally will remain open for public use.	There would be no net increase in permanent roads built in areas where open road densities are 1 mi/mi^2 or less in big game winter and calving ranges unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition.	There would be no net increase in permanent roads built in areas where open road densities are 1.5 mi/mi^2 or less in big game winter and calving ranges unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition.	No new permanent roads would be allowed in areas where open road densities are 0.5 mi/mi^2 or less in big game winter and calving ranges unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition.

	BLM would manage to reduce open road densities in big game winter and calving ranges where they exceed 1 mi/mi^2.	BLM would manage to reduce open road densities in big game winter and calving ranges where they exceed 0.5 mi/mi^2.	BLM would manage to reduce open road densities in big game winter and calving ranges where they exceed 1.5 mi/mi^2.
Wildlife Objectives - Grizzly Bears (Special Status Species) and Roads			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related action.	There would be no net increase in permanent roads built in areas where open road densities are 1 mi/mi^2 or less within the current distribution of grizzly bear unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition. BLM would manage to reduce open road densities within the current distribution of grizzly bear where they exceed 1 mi/mi^2.	There would be no net increase in permanent roads built in areas where open road densities are 1.5 mi/mi^2 or less within the current distribution of grizzly bear unless not possible due to rights-of-way, leases or permits. All practicable measures would be taken to assure that important habitats with low road densities remain in that condition. BLM would manage to reduce open road densities within the current distribution of grizzly bear where they exceed 0.5 mi/mi^2.	Same as Alternative B.
Wildlife Objectives – Big Game Security Cover			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Elk management guidelines in the Montana Cooperative Elk-Logging Study (Lyon et al. 1982) would be followed including: managing public vehicle access to maintain habitat effectiveness of security cover and key seasonal habitat for deer and elk; maintaining adequate untreated peripheral zones around important moist sites; maintaining adequate thermal and security cover on deer and elk habitat, particularly in timber stands adjacent to primary winter foraging areas; ensuring slash depth in clear cuts does not exceed 1.5 feet and generally discouraging thinning immediately adjacent to clear cuts.	Where minimum-size blocks of security habitat (250 acres), as defined by Hillis et al. (1991), are located, they would be retained in a suitable condition during project planning and implementation. Protection of larger blocks of security habitat would also be addressed during project or watershed level planning. Where security habitat is limited or fragmented across the landscape, the BLM would emphasize improving habitat through vegetation treatments and road closures (including seasonal closures) to increase security habitat for big game species.	Same as Alternative B.	Same as Alternative B.

Table 2-23
Comparison of Alternatives

Wildlife - Mountain Mahogany and Bitterbrush Management

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	BLM would enhance and improve big game winter range through protection and restoration of mountain mahogany stands where conifers have become established. Detrimental effects to mountain mahogany stands would be avoided with projects in big game winter range whenever possible. When detrimental effects are unavoidable, loss of mountain mahogany would be minimized. BLM would also proactively restore the distribution and vigor of bitterbrush stands through vegetative treatments designed to reduce competing plants; and create a variety of bitterbrush age classes and conditions conducive to bitterbrush regeneration.	BLM would allow natural processes and continued fire suppression to determine the structure and composition of mountain mahogany stands where conifers have become established. Mountain mahogany stands would be restored or enhanced opportunistically through other higher priority projects. Bitterbrush would be protected or restored opportunistically through other higher priority projects.	Same as Alternative B.

Wildlife - Snag Management

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
In concert with the timber management program, a snag management program would be implemented to enhance habitat for cavity-nesting birds.	To determine the "range of natural conditions" for snag densities, BLM would follow the "Northern Region Snag Management Protocol", Jan. 2000, USDA FS Northern Region, until more current information is available.	Same as Alternative B.	Same as Alternative A.
No related Action	Prescribed fire, mechanical treatments, inoculation, or other appropriate methods would be used to create snags and down woody material where deficient in appropriate vegetation types across the landscape.	Snags and down woody material would be created opportunistically through other project work such as fuels reduction or ecosystem restoration. The focus would be on snag and down wood protection rather than on actively creating these features.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Wildlife - Raptors/Special Status Species

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Noise disturbance/management activities would be avoided or minimized within 0.5 mile of occupied raptor nests during the nesting and brood rearing period.	Noise disturbance/management activities would be avoided or minimized within 1 mile of raptor nests during the nesting and brood rearing period.	Noise disturbance/management activities would be avoided or minimized within 0.25 mile of raptor nests during the nesting and brood rearing period.
No related action	Unoccupied raptor nests (on cliffs, rocky outcrops or in trees) would be protected from removal or destruction for 5 years, or the period a known preferred prey species fluctuates from population highs to lows. The nest would not have to be retained if it is physically damaged past the point of repair by raptors. In forested habitat types, a 0.25 mile buffer of suitable habitat would be maintained around unoccupied nests for 5 years.	Unoccupied raptor nests (on cliffs, rocky outcrops or in trees) would be protected from removal or destruction for 7 years, or the period a known preferred prey species fluctuates from population highs to lows. The nest would not have to be retained if it is physically damaged past the point of repair by raptors. In forested habitat types, a 0.5 mile buffer of suitable habitat would be maintained around unoccupied nests for 7 years.	Unoccupied raptor nests (on cliffs, rocky outcrops or in trees) would be protected from removal or destruction for 3 years, or the period a known preferred prey species fluctuates from population highs to lows. The nest would not have to be retained if it is physically damaged past the point of repair by raptors. In forested habitat types, a 0.25 mile buffer of suitable habitat would be maintained around unoccupied nests for 3 years.

Wildlife - Bald Eagle (Special Status Species)

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Bald eagle nesting and roosting habitats would be actively protected from loss due to fire, insect, or disease by reducing vegetation competition and encroachment in these habitats.	Same as Alternative B.	Same as Alternative A.

Wildlife – Bats (Special Status Species)

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Clearing of vegetation, except noxious weeds, would not be allowed within 250 feet of the entrance of caves and abandoned mines with populations of bats except for public safety. Vegetation could be removed if necessary when installing bat gates, or when it becomes an obstruction to bat movement.	Same as Alternative B.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Wildlife –Westslope Cutthroat Trout (Special Status Species)			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related specific action.	Genetically pure and slightly hybridized (less than 20 percent hybridization) westslope cutthroat trout populations would be managed by maintaining or restoring high-quality habitats and by expanding populations.	All westslope cutthroat trout populations, regardless of hybridization, would be protected by maintaining high-quality habitats and by expanding populations.	Genetically pure and slightly hybridized (less than 10 percent hybridization) westslope cutthroat trout populations would be protected by maintaining or restoring high-quality habitats and by expanding populations.
Wildlife –Non-Native Aquatic Species			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related action.	BLM would work with MFWP to remove brook trout and other non-native aquatic species that out-compete or breed with westslope cutthroat trout through the use of electroshocking or other physical or chemical means.	Same as Alternative B.	Same as Alternative A.
Wildlife –Non-Native Invasive Species			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related action.	To prevent spread of non-native, invasive aquatic species, BLM would post educational signs about waterborne invasive species at all BLM boat ramps.	Same as Alternative B.	To prevent spread of non-native, invasive aquatic species, BLM would install boat wash stations at all major BLM boating access sites.
ISSUE 3:			
Field Office-wide			

Goals

- Provide a balanced approach to travel management that provides a sustained flow of local economic benefits, minimizes or mitigates user conflict, safety concerns, and resource impacts while taking into consideration the unique attributes and values of the various travel management Planning Areas.
- Maintain facilities, roads, and trails to provide for public and/or administrative use and safety while mitigating impacts to resources.

Management Common to All Alternatives

- Travel management would be conducted in a manner that would meet, or move toward meeting, Land Health Standards.
- The 2003 Statewide OHV ROD and Plan Amendment would be followed.
- Previous travel planning decisions made for areas with existing travel plans (Elkhorn Mountains, Clancy-Unionville, Whitetail-Pipestone, and Sleeping Giant and several small "sub-planning" areas) would be brought forward in this RMP revision with no proposed changes.

- BLM would provide for interagency travel management consistency and route connectivity with adjoining public lands.
- Designated routes would be mapped and signed as open or open with restrictions.
- BLM would continue to participate with the Southwest Montana Interagency Travel Management Committee, maintaining map and sign consistency, and seasonal restrictions.
- BLM would continue to partner with the State Trails Program, seeking opportunities to improve existing as well as future trails and facilities.
- Variances to travel plan designations may be issued on a case-by-case basis to conduct essential agency administrative actions and site-specific approved uses such as casual use mineral exploration.
- Wheeled motorized vehicle travel would be allowed for any military, fire, search and rescue, or law enforcement vehicle for emergency operations. Temporary routes could be constructed where needed and where other routes are not available under approved travel management plans. Construction of such routes would be to minimal standards, adhering to BMPs.
- BLM would minimize establishing travel routes in areas identified at risk for noxious weed infestations.
- In areas with sensitive soils, BLM would minimize establishing new routes and would consider closure, restriction, mitigation, or administrative management of existing travel routes.
- Travel planning analysis would be conducted on those routes documented during the inventory period (up to May 2005).
- Short, site-specific sections of route/trail re-alignment, or reconstruction would continue to be implemented as needed to minimize resource damage and/or provide minor reroutes around private property.

Management Common to Action Alternatives (B, C, and D)

- BLM objective in route-specific travel planning within individual TPAs would be to use a systematic process that considers the unique resource issues and social environments of each TPA.
- Travel Plan Areas not analyzed for route-specific management during this RMP revision would be initiated within five years of the completed RMP revision.
- BLM would cooperate with MFWP, adjusting seasonal travel restrictions in accordance with big game hunting season extensions.
- Gates or other barriers would be used as necessary to prevent access on roads and trails closed yearlong to the public.
- Travel route densities would conform with the management prescriptions in the wildlife section of this RMP.
- Loop-road connections would be established, where appropriate, to enhance public access and enjoyment.
- The BLM would emphasize management of the transportation system to reduce impacts to natural resources from authorized roads and trails. The BLM would also stress closing and restoring unauthorized user created roads and trails to prevent resource damage. Ecologically sensitive areas within 300 feet of roads and trails could be closed to dispersed camping if resource damage is found to be occurring in these areas.
- Snowmobile use would be subject to restrictions outlined in specific travel plans. It is the rider's responsibility to avoid locations where wind or topographic conditions may have reduced snow depth and created situations where damage to vegetation or soils could occur, or where vegetation is taller than the protective snow cover. Ecologically sensitive areas could be closed to snowmobiling if resource damage caused or exacerbated by snowmobile activity is found to be occurring in these areas.

Table 2-23
Comparison of Alternatives

Travel Management – Field Office-wide Area Designations

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Areas Designations of "Open", "Closed", and "Limited" would be: Wheeled Vehicles Open – 4,367 acres Closed – 31,500 acres Limited – 271,442 acres Snowmobiles Open – 143,206 acres Closed – 27,065 acres Limited – 137,038 acres	Areas Designations of "Open", "Closed", and "Limited" would be: Wheeled Vehicles Open – 283 acres Closed – 31,500 acres Limited – 275,526 acres Snowmobiles Open – 112,682 acres Closed – 54,706 acres Limited – 139,921 acres	Same as Alternative B for wheeled vehicles. Snowmobiles Open – 26,148 acres Closed – 65,270 acres Limited – 215,891 acres	Same as Alternative B for wheeled vehicles. Snowmobiles Open – 139,138 acres Closed – 31,282 acres Limited – 136,889 acres

Travel Management – Competitive Motorized Events

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Applications for competitive and non competitive organized motorized events would continue to be evaluated on a case by case basis.	Organized competitive and noncompetitive motorized events would be considered and evaluated on a case-by-case basis for the Pipestone area only (existing management). Noncompetitive motorized events would not be allowed outside Pipestone. However, competitive motorized events (timed /speed based) proposed on BLM lands outside Pipestone would be considered, but only if held in conjunction with use of adjacent lands (public or private).	Competitive and organized motorized events would not be allowed. Unless otherwise managed, snowmobile use would be restricted to designated routes only (open or open/restricted), between December 1st and May 15th, snow conditions permitting.	Management for organized motorized events (competitive and non-competitive) would be the same as for Alternative B.

Travel Management – Field Office-wide Snowmobile Use

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Existing management varies, and includes: unrestricted area cross-country travel (conditions permitting), seasonally restricted area cross-country travel, travel on all wheeled designated routes (12/1-5/15), and snowmobile use only routes.	With some exceptions (see site specific travel plan alternatives), cross-country snowmobile use would be allowed, as well as travel on all existing routes (conditions permitting).	Unless otherwise managed, snowmobile use would be restricted to designated routes only (open or open/restricted), during the season of use, 12/1-5/15, snow conditions permitting.	Same as Alternative B.

Table 2-23
Comparison of Alternatives

Travel Management – Travel Route Easements

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Easements would be pursued as needed for new route construction.	BLM would actively seek easements in order to maintain current access for popularly traveled routes, as well as seek additional site-specific opportunities as needed.	BLM would seek public access easements as needed for new road or trail construction.	BLM would seek public access easements for all locations where BLM routes are accessed either from, or cross private property.

Travel Management – Cattle Guards/Gates

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Cattle guards and gates needed to facilitate public travel would be installed on an as needed basis for newly constructed roads/trails.	BLM would replace barbed wire gates (and similar closures) with cattle guards and/or easily operated metal gates wherever problems are known to occur.	Same as Alternative A.	BLM would replace barbed wire gates (and similar closures) with cattle guards and/or easily operated metal gates wherever they currently exist.

Transportation/Facilities

Management Common to Action Alternatives (B, C, and D)

- Roads would be built to the minimum standard necessary that allows reasonable access and has the least impact on resource values.
- If an existing road is substantially contributing to Land Health Standards not being met, the road would be considered for redesign, closure, or decommissioning to minimize the adverse impacts.

Management Common to All Alternatives

- Transportation and road management activity would meet, or move toward meeting Land Health Standards.
- Comprehensive assessments would be conducted for all maintained roads and facilities and maintenance actions would be implemented as needed.
- New permanent roads and trails would be constructed subject to NEPA and approved engineering standards. Consideration would be given to use demands, location, safety, and resource constraints when determining the level of road necessary, in accordance with Manual Section 9113.
- Roads and trails would be maintained in accordance with Travel Management Plan guidance and BLM policy. Roads would be assigned maintenance levels and managed in accordance with these levels and in consideration of resource issues. All roads and trails would be maintained in accordance with standards and guidelines in BLM Handbook 9113-2 and Manual Section 9114. Roads and trails would be inspected on an established schedule in accordance with BLM's Condition Assessment guidance.

Table 2-23
Comparison of Alternatives

Transportation/Facilities - Road Design			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
No related management.	Road designs would include at a minimum: • Minimizing road and landing locations in Riparian Management Zones; • Minimizing sediment delivery to streams from road surfaces; • Outsloping roadway surfaces where possible, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe; • Routing road drainage away from potentially unstable stream channels, fills and hillslopes; • Minimizing disruption of natural hydrologic flow paths; • Minimizing sidecasting of soil or snow.	Same as Alternative B with the additional condition that stream crossings would be designed to accommodate 100-year storm events with associated sediment and debris.	Road designs would include at a minimum: • Minimizing road and landing locations in Streamside Management Zones; • Minimizing sediment delivery to streams from road surfaces; • Outsloping roadway surfaces where possible, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe; • Routing road drainage away from potentially unstable stream channels, fills, and hillslopes.
Transportation/Facilities - Road Design and Maintenance			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
BLM would use Water Quality Best Management Practices for Montana Forests during road construction and maintenance.	Roads would be designed and maintained in a manner that provides for water quality protection by controlling placement of fill material, keeping drainage facilities open, installing and maintaining appropriately-sized culverts at stream crossings, and by repairing ruts and failures to reduce erosion and sedimentation of aquatic habitats.	Roads would be designed and maintained in a manner that provides for water quality protection by controlling placement of fill material, keeping drainage facilities open, installing and maintaining stream crossings capable of accommodating 100-year storm events including associated sediment and debris, and by repairing ruts and failures to reduce erosion and sedimentation of aquatic habitats.	Roads would be designed and maintained in a manner that provides for water quality protection by controlling placement of fill material, keeping drainage facilities open, installing and maintaining appropriately-sized culverts at stream crossings, and by repairing ruts and failures to reduce erosion and sedimentation of aquatic habitats.

Table 2-23
Comparison of Alternatives

ISSU

Goals

- Provide a diverse array of recreational opportunities while maintaining healthy public land resources.
- Establish, manage, and maintain quality recreation sites and facilities to meet a broad range of public needs subject to resource constraints.
- Manage commercial, competitive, or special events with special recreation permits that eliminate or mitigate impacts to resources and conflicts with other users.
- Manage recreation opportunities to provide a sustained flow of local economic benefits and protect non-market economic values.
- "Leave No Trace" and "Tread Lightly" practices would be promoted.
- BLM would support events that emphasize collaborative outreach and public awareness.
- BLM would support and utilize volunteers.

Management Common to All Alternatives

- BLM would continue to provide a diverse range of quality recreation opportunities and experiences commensurate with public demands, resource considerations, management capabilities, and existing program guidance.
- Comparable, cost effective and value based fee systems would be established for services and facilities provided to public users in accordance with the Butte Field Office Recreation Fee Area (MT-02) Business Plan, BLM directives and the Federal Lands Recreation Enhancement Act. This Business Plan would be updated every five years.
- There are no known significant caves or karsts in the Decision Area. Should these resources be discovered, BLM would develop management plans appropriate for the specific resource in accordance with Bureau directives.
- Recreation users would be limited to 14-day camping stays with the exceptions presented under Recreation Management – Management Common to All Alternatives.
- Personal property of recreational users could not be unattended for more than 24 hours at recreation sites or for more than 72 hours on other BLM lands.
- BLM would establish and maintain information kiosks with site maps, brochures, interpretive and educational information, important contacts, and site regulations at recreation sites.
- BLM would continue to conduct periodic accessibility, safety, and condition assessments in accordance with Bureau policy at developed recreation sites. Prioritize available funds to resolve deferred and corrective maintenance needs.
- BLM would conduct annual evaluations of all fee sites that address project needs, support equipment, visitor services, public comments, administrative needs, fees, site regulations, and conflict concerns.
- Working relationships with tourism organizations, recreation interest groups, and local/state/other federal governments would be maintained and expanded to enhance visitor services, management efficiencies, and recreation opportunities.
- Partnership agreements that are mutually beneficial to BLM and the public would be established and maintained to enhance comprehensive planning, collaborative management, and collective funding.

Table 2-23
Comparison of Alternatives

RECREATI

Management Common to All Alternatives - continued

- BLM would develop and strive to maintain an agreement with MFWP that would establish partnership efforts and responsibilities to collectively manage the Black and White Sandy sites on Hauser Lake.
- SRMAs would be given management priority to provide quality recreation opportunities and visitor experiences. All remaining lands would be managed as an Extensive Recreation Management Area (ERMA). This area would generally be given less priority in terms of on-the-ground management, improvements, and facility maintenance.
- BLM would pursue opportunities to expand day-use parking capacities on Holter Lake in cooperation with the Missouri/Madison Comprehensive Recreation Plan.
- Organized competitive and non-competitive motorized events would be considered and evaluated on a case-by-case basis for the Pipestone area only (existing management). Non-competitive motorized events would not be allowed outside Pipestone. However, competitive motorized events (timed/speed based) proposed on BLM lands outside Pipestone would be considered, but only if held in conjunction with adjacent lands (public or private). New permits would not be authorized that directly conflict with permitted uses. Existing permittees would be given preference.

Management Common to Action Alternatives (B, C, and D)

- BLM would establish designated boat-in camp sites along the shoreline of Holter Lake and consider a similar designation effort for the Hauser Lake shoreline should resource concerns warrant.
- In accordance with policy guidance (IM No. 2004-150), a greater priority would be placed on extending appropriate, reoccurring permits from five years to 10 years.
- New special recreation use permits would be analyzed and mitigated to meet management objectives.
- BLM would coordinate with MFWP to manage appropriate uses at BLM launch sites as necessary to ensure quality recreation opportunities and experiences on State waters and affected BLM lands.
- New sites would be developed commensurate with public demand, resource constraints, and management capabilities. Priority would be given to new sites that have partnership funding strategies and are consistent with established ROS and SRMA management guidelines.
- If an existing developed recreation site significantly contributes to Land Health Standards not being met, the impacts from the site would be minimized to the extent possible.
- All new recreation sites would be designed, constructed, and managed to meet, or move toward meeting, Land Health Standards.

Recreation – Permits

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No fees would be charged for commercial fishing and floating outfitters using developed BLM river access sites.	Day-use Special Recreation Permits would be issued for commercial fishing and floating uses at BLM river access sites. Outfitters would be annually billed an **advance flat fee** (currently	Day-use Special Recreation Permits would be issued for commercial fishing and floating outfitters using developed BLM river access sites. Fees would be based on actual use reports and estab-	Fees would be postponed for commercial fishing and floating outfitters using developed BLM river access sites until a multi-agency statewide fee system is established. Under this system, BLM

Table 2-23
Comparison of Alternatives

	$90.00) established by the Director based on the Implicit Price Deflator Index. Long-term BLM would continue to coordinate with MFWP to enhance river/corridor land management and to possibly develop a multi-agency statewide fee system for the commercial uses of river access sites.	lished BLM policies.	would receive a portion of collections based on a percentage of total sites under the statewide system.
Recreation – 14-Day Camping Variances			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Variances (extensions) to the 14-day camping limit would be considered on a case-by-case basis subject to the following considerations: resource impacts, social conflicts, sanitation concerns, no livestock or commercial activities would be involved.	Variances to the 14-day camping limit during the hunting season would be considered on a case-by-case basis subject to the following considerations: resource impacts, social conflicts, and sanitation concerns, no livestock, or commercial activities would be involved. Preference will be given to developed recreation sites since they provide hardened camping units, toilet facilities, and good access during this low use season.	No variances to 14-day camping limits would be allowed.	Same as Alternative B.
Recreation – Permits			
Alternative A - No Action	**Alternative B - Preferred**	**Alternative C**	**Alternative D**
Authorization of commercial camping activity would be considered throughout the Field Office on a case-by-case basis subject to resource constraints, management capabilities, social conflicts, and public health and safety concerns.	Commercial camping permits within developed fee sites would not be allowed during the fee season to reduce user conflicts and resource impacts (Memorial Day to Labor Day).	Same as Alternative B.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Recreation – Permits

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Permit requests by outfitter and guide hunters would be considered on a case-by-case basis throughout the Field Office, subject to environmental, social, and public health and safety concerns.	Special recreation permits would be limited to day-use activities during the hunting season with the exception that camping uses would only be considered within developed recreation sites during the non-fee season.	Special recreation use permits during the hunting season would be limited to day-use activities only.	Same as Alternative A.

Recreation – Hauser Lake Boat-in Camping

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Boat-in camping would be allowed along the entire BLM shoreline of Hauser and Holter Lakes subject to current regulations.	Boat-in camping at dispersed sites (excludes developed sites) on BLM lands along the Holter Lake shoreline would be limited to designated sites only. Site availability would be determined through a field evaluation by an interdisciplinary team. Suitable sites where impacts to other important resources are acceptable would be designated, signed, and available to the public on a first-come, first-served basis. A similar management system should be considered and implemented along Hauser Lake should conditions warrant.	The entire BLM shoreline on Hauser and Holter Lakes excluding developed sites would be closed to camping.	Same as Alternative A.

Recreation – Bear/Human Interactions

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Human food storage regulations would be developed and implemented for all recreation sites with high potential and/or known encounters between people and bears.	Same as Alternative B.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Recreation – Recreation Opportunity Spectrum

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No ROS classifications would be established to guide the management of appropriate settings and visitor opportunity experiences.	ROS classifications would be: • Semi-Primitive Non-Motorized – 36,800 acres • Semi-Primitive Motorized – 71,800 acres • Roaded Natural – 171,100 acres • Roaded Modified – 16,600 acres • Rural – 11,000 acres	ROS classifications would be: • Semi-Primitive Non-Motorized – 63,700 acres • Semi-Primitive Motorized – 66,900 acres • Roaded Natural – 158,100 acres • Roaded Modified – 15,900 acres • Rural – 2,700 acres	ROS classifications would be: • Semi-Primitive Non-Motorized – 30,000 acres • Semi-Primitive Motorized – 37,600 acres • Roaded Natural – 186,100 acres • Roaded Modified – 19,600 acres • Rural – 34,000 acres

Recreation – Special Recreation Management Areas (SRMAs)

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Recreation management would continue to be prioritized in the following five areas: Holter Lake/Sleeping Giant, Lewis & Clark National Trail, Upper Big Hole River, Humbug Spires, and Scratchgravel Hills.	Recreation management would be prioritized in the following nine areas: Lower Holter Lake/Missouri River, Sleeping Giant/Missouri River, Hauser Lake, Uppermost Missouri River, Scratchgravel Hills, Sheep Mountain, Pipestone, Upper Big Hole River, and Humbug Spires.	Same as Alternative B.	Recreation management would be prioritized in the following five areas: Lower Holter Lake/Missouri River, Hauser Lake, Uppermost Missouri River, Pipestone, and Upper Big Hole River.

ISSUE 5:

Goals

- Designate ACECs where special management attention is required to protect important and relevant values.
- Manage National Trails to promote public enjoyment and protect their designated values.
- Manage preliminarily eligible river segments so that their suitability for potential National Wild and Scenic Rivers System designation is not impaired.
- Manage Wilderness Study Areas so that their suitability for potential wilderness designation is not impaired.

Table 2-23
Comparison of Alternatives

Special Designations – ACEC

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Sleeping Giant ACEC (11,679 acres) would continue to be managed as an ACEC under the existing management plan.	Approximately 70,644 acres would be managed in the following four potential ACECs to protect relevant and important values: • Sleeping Giant (11,679 acres) • Elkhorns (50,431 acres) • Humbug Spires (8,374 acres) • Ringing Rocks (160 acres within existing withdrawal)	Approximately 87,893 acres would be managed in the following five potential ACECs to protect relevant and important values: • Sleeping Giant (11,679 acres) • Elkhorns (67,665 acres) • Humbug Spires (8,374 acres) • Spokane Creek (14 acres) • Ringing Rocks (160 acres within existing withdrawal)	Approximately 23,695 acres would be managed in the following three potential ACECs to protect relevant and important values: • Sleeping Giant (11,679 acres) • Elkhorns (3,575 acres) • Humbug Spires (8,374 acres)

Special Designations – National Trails

Management Common to All Alternatives

- The Continental Divide Trail would be managed cooperatively with the USFS in accordance with national policy guidelines. The Lewis and Clark Historic Trail would be managed cooperatively with the National Park Service (NPS) in accordance with national policy guidelines.
- BLM would seek opportunities to cooperatively manage National Trails through partnerships.
- BLM would continue cooperative efforts with PPLM and other partners to collectively manage the Lewis and Clark National Historic Trail under the Missouri/Madison Comprehensive Recreation Plan. All historical recreation sites within the trail corridor would continue to be managed in a manner that promotes public accessibility, resource protection, visitor safety, and interpretive education.

Special Designations – National Trails – continued

Management Common to Action Alternatives (B, C, and D)

- The two National Trails (Continental Divide National Scenic Trail and Lewis and Clark National Historic Trail) would be managed in accordance with the ROS classes, VRM classes, travel plan direction, and oil and gas stipulations established under the action alternatives.
- BLM would evaluate opportunities to re-route the Continental Divide Trail segment in coordination with the USFS to enhance non-motorized opportunities; reduce current needs for use easements/acquisitions through private lands; and remove motorized conflicts associated with the motorized road.

Special Designations – Wild and Scenic Rivers

Management Common to All Alternatives

- In cooperation with other agencies, local governments, and special interest groups, management would be conducted in a manner to protect and enhance the outstandingly remarkable values for each suitable river segment.

Table 2-23
Comparison of Alternatives

Special Designations – Wild and Scenic Rivers

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
The suitability study of the four river segements (Upper Big Hole River - 2.3 miles, Missouri River - 3.1 miles, Moose Creek - 4.0 miles, and Muskrat Creek - 2.6 miles) determined to be eligible for designation in the National Wild and Scenic River System would not be completed and protective management would continue indefinitely for all four river segments.	Muskrat Creek (2.6 miles) would be recommended as suitable for inclusion in the National Wild and Scenic Rivers System (NWSRS). Missouri River (3.1 miles) would be found preliminarily suitable, but would only be recommended for inclusion in the NWSRS pending USFS (Helena National Forest) concurrence and coordination. The Upper Big Hole River and Moose Creek segments would not be recommended as suitable.	Under Alternative C all four eligible river segments (totaling 12 miles) would be recommended as suitable for inclusion in the National Wild and Scenic Rivers System.	None of the four eligible river segments would be recommended as suitable for inclusion in the National Wild and Scenic River System.

Special Designations – Wilderness Study Areas

Management Common to All Alternatives

- All six WSAs (Humbug Spires, Sleeping giant, Sheep Creek, Black Sage, Elkhorns Tack-on, and Yellowstone River Island) would continue to be managed under the Interim Management Policy and Guidelines for Lands under Wilderness Review until such time as Congress either designates them as wilderness or releases them from further consideration as wilderness.
- WSAs would continue to be managed in accordance with the established monitoring and sign plans for each WSA.
- Sleeping Giant and Sheep Creek WSAs would continue to be managed as part of the Sleeping Giant ACEC and management plan.

Management Common to Action Alternatives (B, C, and D)

- Sleeping Giant, Sheep Creek, Humbug Spires, and Elkhorns Tack-on WSAs would be managed as ACECs as per management direction described in the ACEC section regardless of whether Congress designates them as wilderness or releases them from wilderness consideration.
- In the event that Congress releases Black Sage and Yellowstone Island WSAs from wilderness consideration, they would be managed as per management direction described by alternative as described above in Chapter 2.

Table 2-23
Comparison of Alternatives

Management Concern: Air Resources

Goals

- Ensure BLM authorizations and management activities protect the local quality of life and sustain economic benefits by complying with Tribal, local, state, and federal air quality regulations, requirements, and implementation plans.

Management Common to All Alternatives

- BLM would continue to participate in local, state, and federal ambient air quality monitoring programs, as required.
- BLM would comply with local, state, and federal regulatory requirements.
- All resource uses would meet the Land Health Standards for air quality.
- Management would minimize or prevent air quality degradation throughout the Planning Area by applying mitigation measures to projects.
- Mitigation measures would be developed as appropriate to ensure compatibility of projects with air resource management.

Management Concern: Soils

Goals

- Manage uses to minimize accelerated soil erosion and compaction and maintain surface soil water infiltration based on site-specific conditions.
- Maintain or improve soil health and fertility, prevent or minimize erosion and compaction while supporting multiple use management.

Management Concern: Soils – continued

Management Common to All Alternatives

- Soil management objectives would include: reducing soil erosion associated with steeper slopes, granitic soils, and high recreational use areas; reducing sediment delivery to streams; reducing soil movement resulting from burned areas, aboveground disturbances, and accelerated streambank erosion.
- BMPs would be implemented at the site-specific project level to maintain or improve the soil resources.
- Soil compaction and erosion problems would be diagnosed using Land Health Standards.
- Mitigation or seasonal activity restrictions would be applied to activities in areas with significant soil compaction or accelerated erosion.

Management Common to Action Alternatives (B, C, and D)

- BLM would reseed disturbed areas where needed.

Table 2-23
Comparison of Alternatives

Management Concern: Water Quality

Goals

- Restore and/or maintain the chemical, physical, and biological integrity of water resources to protect designated beneficial uses and achieve water quality standards.
- Maintain existing or acquire new water rights on BLM land to ensure water availability for multiple-use management.
- Minimize erosion and accelerated runoff to streams to improve watershed function.
- Maintain or improve morphological conditions to a stable state that can fully support beneficial uses.
- Protect water quality for municipal, industrial, agricultural, recreation, and residential purposes by adopting protective measures to meet tribal, state, and local water quality requirements.

Management Common to All Alternatives

- Land Health Standards would be implemented to protect beneficial uses of water are protected and ensure that water quality meets State standards.
- BLM would continue to cooperate with Montana Department of Environmental Quality and communities in the development of Water Quality Restoration Plans and Source Water Protection Plans.
- BLM would comply with non-degradation provisions of the Montana Water Quality Act.
- Projects would be reviewed on a case-by-case basis to minimize impacts to water quality.
- Water rights and instream flow reservations would be maintained subject to Montana water law.

Management Common to Action Alternatives (B, C, and D)

- Existing water rights would be maintained to ensure water availability for multiple-use management and proper functioning riparian and upland areas.
- Water quality would be monitored to establish baseline conditions, identify areas of concern, and document progress from mitigation measures.
- BLM would participate in the development, implementation, and monitoring of water quality restoration plans/TMDL plans.

Management Concern: Water Quality - Total Maximum Daily Loads (TMDLs)

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Present levels of stream restoration activities would continue. Progress of past actions to improve water quality would be monitored.	BLM would examine "Water Quality Restoration Plans" (Plans) to determine if reduction targets of pollutants (TMDLs) are reasonable and attainable. Plans would be implemented as funding becomes available.	BLM would reduce pollutants in streams to levels indicated in "Water Quality Restoration Plans." Plans would be implemented as funding becomes available.	Same as Alternative A.

Table 2-23
Comparison of Alternatives

Management Concern: Water Quality - Water Rights

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	BLM would consider acquiring water rights from willing sellers.	Same as Alternative B.	No related action.

Management Concern: Water Quality - Fire Rehabilitation

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
No related action.	Burned areas would be monitored for weed infestations and accelerated soil erosion. Where sedimentation impacts adjacent streams, erosion would be mitigated.	Accelerated soil erosion and sedimentation in burned areas would be mitigated.	No related action.

Management Concern: Visual Resources

Management Common to All Alternatives

- Visual resources would be managed according to VRM classes as described in Appendix C.
- Visual resource design techniques and best management practices would be use to minimize short and long-term visual impacts of projects.
- Visual contrast ratings for major projects within VRM Class I, II, and III areas would be completed according to BLM Handbook H-8341-1.
- VRM Class I objectives would be maintained for all WSAs.

Management Common to Action Alternatives (B, C, and D)

- VRM classifications would be established for all BLM lands based on visual resource characteristics.

Management Concern: Visual Resources

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Approximately 31,500 acres would be managed as VRM Class I.	Approximately 31,500 acres would be managed as VRM Class I.	Approximately 31,500 acres would be managed as VRM Class I.	Approximately 31,500 acres would be managed as VRM Class I.
Approximately 25,400 acres would be managed as VRM Class II.	Approximately 48,900 acres would be managed as VRM Class II.	Approximately 67,600 acres would be managed as VRM Class II.	Approximately 6,600acres would be managed as VRM Class II.
Approximately 250,400 acres would be managed as VRM Class III and IV. These areas would continue to be evaluated and protected on a case-by-case basis through project/activity plans.	Approximately 125,200 acres would be managed as VRM Class III.	Approximately 151,700 acres would be managed as VRM Class III.	Approximately 142,900 acres would be managed as VRM Class III.
	Approximately 101,700 acres would be managed as VRM Class IV.	Approximately 56,500 acres would be managed as VRM Class IV.	Approximately 126,300 acres would be managed as VRM Class IV.

Table 2-23
Comparison of Alternatives

Management Concerns: Cultural Resources, Traditional Cultural Properties and Paleontological Resources

Goals

- Preserve and protect eligible cultural resources, and traditional cultural properties within the BFO.
- Identify cultural resource sites and traditional cultural properties and mitigate impacts when necessary, from natural or human-caused deterioration.
- Preserve and protect eligible cultural resources to ensure that they are available for appropriate uses by present and future generations.

Management Common to All Alternatives

- BLM would conduct inventories as per Section 106 of the National Historic Preservation Act to avoid disturbance to cultural resources.
- To minimize impacts to significant cultural resources, projects would be designed to avoid disturbance or mitigated through data recovery as a last resort.
- BLM would continue to consult with tribal governments to meet requirements under federal law and insure protection of sites important to Indian Tribes.
- BLM's consultation process for historic mining sites would continue in accordance with the Historic Placer and Lode Mining Properties Programmatic Agreement that specifies creation of a historic preservation plan to organize and compile what is known about various historic mining districts.
- Fossil localities would be afforded the same consideration as historic sites during project planning.
- Projects would be redesigned to avoid or minimize effects to fossil localities. If this is not feasible then specimens would be excavated by permitted paleontologists.

Management Concerns: Cultural Resources, Traditional Cultural Properties

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
BLM would inventory 100 acres per year in compliance with Section 110, National Historic Preservation Act.	BLM would identify areas with a high potential for various archaeological/ historical site types, and conduct 200 acres of proactive inventory in those areas each year. One hundred acres of low potential areas would be inventoried each year for comparison.	BLM would identify areas with a high potential for various archaeological/ historical site types, and conduct 1,000 acres of proactive inventory in those areas. Three hundred acres of low potential areas would be inventoried each year for comparison.	BLM would conduct proactive inventories as time permits.
Educational and public outreach programs would be provided as requested and volunteer assistance relationships would be developed as time permits.	Educational and public outreach programs would be provided as requested.	Educational and public outreach programs would be provided as requested.	Educational and public outreach programs would be provided as requested.
No related action.	Eligible historic buildings would be maintained consistent with National Park Service standards as funding permits.	Same as Alternative B.	No related action.

Table 2-23
Comparison of Alternatives

Management Concern: Paleontological Resources

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
At the project level, BLM would continue to map fossil localities so as to avoid them during project implementation. If the locality cannot be avoided, then permitted paleontologists would be contacted to assist in removal of fossil resources.	Same as Alternative A.	At the project level, BLM would continue to map fossil localities so as to avoid them during project implementation. If the locality cannot be avoided, permitted paleontologists would be contacted to assist in removal of fossil resources. BLM would cooperate with permitted institutions/parties to map and record fossil localities.	Same as Alternative A.

Management Concern: Lands and Realty – Land Use Authorizations

Goals

- Look for opportunities to acquire non-federal land or interest in non-federal land with important resources and resource uses.
- Provide for land-use opportunities to provide a sustained flow of economic benefits and meet local infrastructure needs while protecting or minimizing adverse impacts to resources and resource uses.

Management Concern: Lands and Realty – Land Use Authorizations – continued

Management Common to All Alternatives

- Land use authorization requests would be analyzed and mitigation measures would be applied on a case-by-case basis.
- New right-of-way facilities would be located within or adjacent to existing rights-of-way to the extent practical.
- New communication site users would be grouped into existing facilities to minimize impacts to other resources and expedite permitting process.
- Site plans would be completed prior to authorizing communication site uses in new areas.
- Proposals for renewable energy development would be considered on a case-by-case basis. Guidelines and Best Management Practices (BMPs) from the Wind Energy Development Programmatic EIS would be used when considering wind energy projects on BLM land.
- Suggested Practices for Raptor Protection on Power Lines (APLIC 1996) would be implemented in the construction and operation of right-of-way facilities.
- Owners of non-Federal land surrounded by public land managed under FLPMA would be allowed a degree of access across public land to provide for reasonable use and enjoyment of non-Federal lands.
- Pre-FLPMA rights-of-way constructed on public lands prior to FLPMA would be recognized as valid uses even though laws under which they were authorized were repealed by FLPMA. If these rights-of-way expire, holders would be required to apply for new FLPMA rights-of-way.

Management Common to Action Alternatives (B, C, and D)

- Existing Communication Sites at Boulder, Bull Mountain, Limestone Hills, Montana City, Mt. Belmont, Toston, and Wickes would be formally designated as communication sites for the BFO. New facilities within designated sites would conform to existing site plans. Once designated communications sites are filled to near capacity, new site locations may be authorized after site management plans and site-specific NEPA analyses are completed.
- No new rights-of-way would be authorized in identified exclusion areas (approximately 27,361 acres)
- New rights-of-way in identified avoidance areas (approximately 75,626 acres) would be allowed only if no other routing options exist. Valid existing rights-of-way in avoidance areas would be recognized and holders would be allowed to maintain their facilities.
- Two utility corridors, originally considered in the 1992 Western Regional Corridor Study would be designated where they cross BFO lands.
- New leases, permits, rights-of-way, and easements would be authorized in a manner consistent with meeting Land Health Standards and applicable Best Management Practices.
- Attempts would be made to negotiate changes in existing authorizations which would meet or move toward meeting Land Health Standards.

Management Concern: Lands and Realty – Withdrawals

Management Common to All Alternatives

- Existing withdrawals would be reviewed prior to the end of the withdrawal period to determine if they should be extended, revoked, or modified. Withdrawals no longer needed for their original intended purpose would be recommended for revocation or modification.
- New withdrawal proposals would be considered where land would transfer from one federal agency to another or where resource values or agency investments are best protected by withdrawal if strongly justified and in conformance with current withdrawal and mineral policy.
- If legislation is passed for a military withdrawal west of Townsend it would be adopted in the Approved Resource Management Plan as described in the Record of Decision for this RMP.
- Land classifications, as "de facto" withdrawals, would be reviewed to determine if they should be continued or terminated. Classification and Multiple Use Act retention classifications would be terminated.
- The Recreation and Public Purpose classification on 200 acres at the Deep Creek Ski Area would be terminated.
- The parcel used by Last Chance Handgunners under an R&PP lease in Boulder would be reclassified for disposal.

Alternatives A and D

- Withdrawals would be considered on a case-by-case basis.

Alternatives B and C

- Priority for new withdrawals would be for all developed and undeveloped recreation sites followed by new acquisitions through exchange or purchase, and in ACECs to protect resources and values as needed.

Table 2-23
Comparison of Alternatives

Management Concern: Lands and Realty – Withdrawals

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Withdrawals from mineral entry would be considered on a case-by-case basis.	Priority for new withdrawals would be for all developed recreation sites, followed by new acquisitions and ACECs to protect resources as needed.	Same as Alternative B.	Withdrawals from mineral entry would be considered on a case-by-case basis.

Management Concern: Lands and Realty – Land Ownership Adjustment

Goals

- Look for opportunities to acquire non-federal land or interest in non-federal land with important resources and resource uses.
- Provide for land-use opportunities to provide a sustained flow of economic benefits and meet local infrastructure needs while protecting or minimizing adverse impacts to resources and resource uses.

Management Common to All Alternatives

- Methods of land ownership adjustment would include exchanges, sales, transfers, fee acquisition, and donation.
- Public access would be maintained or improved through all land ownership adjustment transactions.
- BLM land within disposal areas would be made available for sales, exchanges, or both. Some lands identified for disposal would be retained in public ownership based on site-specific application of the land ownership adjustment criteria (Appendix L).
- Lands to be sold would meet the following disposal criteria from FLPMA:

❖ Such land must be difficult and uneconomic to manage as part of the public land base, and must not be suitable for management by another federal department or agency.

❖ Such land must have been acquired for a specific purpose and must no longer be required for that or any other federal purpose.

❖ Disposal of such land will serve important public objectives that can only be achieved prudently or feasibly if the land is removed from public ownership and if these objectives outweigh other public objectives and values that would be served by maintaining such land in federal ownership.

No BLM lands in the BFO are suitable for Desert Land Entry. Alternative A

- Land ownership adjustment guidance would be provided by the 1984 Headwaters RMP, 1979 Dillon Management Framework Plan, and "Land Pattern and Land Adjustment, Supplement to the State Director Guidance for Resource Management Planning in Montana and the Dakotas, 1984" as amended by the 1989 State Director's guidance pertaining to access.
- Non-federal land to be acquired by the BFO through exchanges would generally be located in retention areas.

Management Common to Action Alternatives (B, C, and D)

- Approximately 298,408 acres of BLM land would be identified in the retention category.
- High priority lands for retention and potential future acquisition would include those in and immediately adjacent to special designation areas (ACECs, Wild and Scenic Rivers, Wilderness Study Areas, National Trail Corridors, Special Recreation Management Areas, and recreation sites) as well as habitat for priority and special status species.

- Approximately 8,901 acres of land would be identified as available for disposal.
- Lands leased or conveyed under the R&PP Act would be classified for such disposal under Section 7 of the Taylor Grazing Act (42 USC 315f) and 43 CFR 2400.
- Right-of-way holders would be issued perpetual easements for their facilities prior to the disposal of any BLM parcels.

Management Concern: Lands and Realty – Access and Unauthorized Land Use

Management Common to All Alternatives - Access

- BLM would acquire legal public access and administrative access to BLM land from willing landowners through easements, fee purchase, exchange, donation, and/or long-term land use agreements.

Alternative A

- Access acquisition efforts would be focused on larger blocks of BLM land which are designated for retention, areas with important resource values, areas where public demand for access is high, and areas with substantial BLM investments.

Management Common to Action Alternatives (B, C, and D)

- Acquisition of access would be focused on routes designated as "open" in travel plans that lack legal public access. Criteria described in **Appendix L** would be used for identifying new access opportunities and managing existing access to BLM lands.

Management Common to All Alternatives – Unauthorized Land Use

- BLM would abate realty-related unauthorized use through prevention, detection, and resolution. Unauthorized use of BLM administered land would be resolved through termination, short or long-term authorization, sale, or exchange as appropriate. Resolution of trespasses would require settlement of trespass liabilities and reclamation of any resource damage.

Management Concern: Minerals

Goals

- Ensure that federal minerals are available for energy and mineral exploration and development.
- Manage exploration and development of mineral resources and ensure they are conducted in an environmentally sound manner.
- Where possible, conserve significant or unique geological features.

Management Common to All Alternatives

- The BLM Energy and Non-Energy Mineral Policy, which references several existing acts, recognizes the nation's need for domestic sources of minerals, energy, and other resources and the responsibilities concerning the discovery, development, production and acquisition of minerals and metals. All Energy and Minerals exploration, development, and production activities would be managed to prevent unnecessary or undue degradation. Management Common to Action Alternatives (B, C, and D)
- For all exploration and mining proposals, BLM would ensure operations take all practical measures to maintain, protect, or minimize disturbances to resources.

Table 2-23
Comparison of Alternatives

Management Concern: Minerals

- Mineral activity would be managed to meet, or move toward meeting Land Health Standards.
- Future changes to ESA listings of species or occupied habitats may require changes or modifications of proposed activities to comply with the requirements of the act.

Management Concern: Minerals – Roads

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Mineral operations permits would identify requirements and BMPs necessary to avoid or minimize adverse effects on natural resources.	Where no alternative to road construction exists, roads (including in riparian areas) would be kept to the minimum necessary for the approved mineral activity. Roads and facilities would be closed and the landscape rehabilitated when no longer required for mineral or land management activities.	No new or existing mineral operations (salable, leasable, and locatable) would be allowed to construct new structures, support facilities, or roads inside Riparian Management Zones.	New and existing mineral operations (salable, leasable, and locatable) would be allowed to construct structures, support facilities, and roads in riparian areas using stipulations and BMPs when necessary. Roads and facilities no longer needed for mineral or land management would be reclaimed to the best extent possible.

Management Concern: Minerals – Leasable Solid Minerals

Management Common to All Alternatives

- BLM would consider proposals for developing leasable solid minerals (coal, phosphate, sodium, potash, sulphur, oil shale, native asphalt, and solid and semi-solid bituminous rock) under the administration of the federal government on a case-by-case basis. Site-specific environmental analysis would be required to lease these minerals.

Management Concern: Minerals – Leasable Fluid Minerals (Oil and Gas)

Management Common to All Alternatives

- Public lands available for oil and gas leasing would be offered first by competitive bid at an oral auction.
- Appropriate stipulations, terms, and conditions would be applied at the time of leasing.
- Interim management policy and guidelines for mineral leasing in WSAs would be applied as appropriate. All WSAs would be closed to new oil and gas leases where BLM owns both the surface and sub-surface. This acreage totals about 28,774 acres.

Management Concern: Minerals – Leasable Fluid Minerals (Oil and Gas)

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Approximately 31,911 acres would be open to leasing, subject to standard lease terms. Approximately 313,694 acres would be	Approximately 17,943 acres would be open to leasing, subject to standard lease terms. Approximately 325,165 acres would be	Approximately 17,016 acres would be open to leasing, subject to standard lease terms. Approximately 30,983 acres would be	Approximately 54,079 acres would be open to leasing, subject to standard lease terms. Approximately 468,421 acres would be

Table 2-23
Comparison of Alternatives

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
open to leasing under Controlled Surface Use/Timing Limitation stipulations.	open to leasing under Controlled Surface Use/Timing Limitation stipulations.	open to leasing, subject to Controlled Surface Use stipulations.	open to leasing, subject to Controlled Surface Use/Timing Limitation stipulations.
Approximately 251,779 acres would be open to leasing subject to No Surface Occupancy stipulations. Approximately 54,810 acres would be unavailable for leasing: 28,774 acres would be in WSAs; 26,036 acres would be within core areas of state wildlife management areas and in lands recently acquired with LWCF funds.	Approximately 280,312 acres would be open to leasing, subject to No Surface Occupancy stipulations. Approximately 28,774 acres would be unavailable for leasing in WSAs.	Approximately 23,903 acres would be open to leasing, subject to No Surface Occupancy stipulations. Approximately 580,382 acres would be unavailable for leasing within the following areas: • prairie dog towns • sage grouse winter/spring range • 0.5 mile of sage grouse strutting grounds • state wildlife management areas • big game winter/spring range • elk calving/big game birthing areas • bighorn sheep yearlong range • 1 mile of bald eagle nest site/breeding habitat • 0.5 mile of raptor breeding territories • 1 mile of peregrine falcon nest sites/breeding habitat • 0.5 mile of ferruginous haw breeding territories • 0.5 mile of westslope cutthroat trout habitat (90-99 percent genetically pure) • 0.5 mile of Yellowstone cutthroat trout habitat • municipal watersheds • WSAs • lands acquired with LWCF funds.	Approximately 93,288 acres would be open to leasing, subject to No Surface Occupancy stipulations. Approximately 28,774 acres would be unavailable for leasing in WSAs with an additional 7,632 acres unavailable in lands recently acquired with LWCF funds.

Table 2-23
Comparison of Alternatives

Management Concern: Minerals - Geothermal

Management Common to All Alternatives

- Lands in the Decision Area would be available for geothermal leasing, unless located within WSAs or in instance where it is determined that issuing leases would cause unnecessary or undue degradation to public lands or resources.
- Stipulations developed for oil and gas leases would be applied to geothermal leases if appropriate.

Management Concern: Minerals - Geophysical Exploration

Management Common to All Alternatives

- BLM would review Notices of Intent to Conduct Geophysical Exploration and develop appropriate mitigation measures so as not to create undue and unnecessary degradation. A site-specific environmental analysis would be prepared for each NOI filed.

Management Concern: Minerals - Locatable Minerals

Management Common to All Alternatives

- At a minimum, an annual compliance inspection of each active notice would be conducted.
- Opportunities and accessibility to mineralized areas for exploration and development would be provided.
- Special project design measures would be incorporated into exploration and development projects as needed to prevent unnecessary or undue degradation to other resources such as special status or priority species, visual corridors, cultural resource sites, and fossil localities.
- Reclamation and restoration activities would be monitored to determine effectiveness of management practices.
- For placer mining operations, reclamation activities would be required to restore stream channels and riparian habitats to functioning condition as close to pre-mining conditions as possible.
- As information becomes available, known areas of geological hazards (e.g. landslide prone areas, avalanche areas, etc.) would be mapped.

Management Concern: Minerals - Locatable Minerals - Withdrawals

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
Approximately 6,300 acres of land would remain withdrawn from locatable mineral entry. Many of these acres are included in Power Site Reserve and Power Project withdrawals.	Same as Alternative A for existing withdrawals.	Same as Alternative A for existing withdrawals.	Same as Alternative A for existing withdrawals.

No related action for newly proposed withdrawals.	An additional approximately 198 acres would be recommended for withdrawal from mineral entry if justified and in conformance with current withdrawal and mineral policy. These acres are located in eight different recreation sites.	An additional approximately 378 acres would be recommended for withdrawal from mineral entry if justified and in conformance with current withdrawal and mineral policy. Approximately 198 of these acres are located in eight different recreation sites. The remaining approximately 180 acres are in riparian areas of Muskrat Creek and Nursery Creek to protect an important genetically pure westslope cutthroat trout population.	Same as Alternative A.

Management Concern: Minerals - Salable Minerals

Management Common to All Alternatives

- Salable mineral sites would have approved mining and reclamations plans and environmental analyses prior to be opened.
- Mineral material would be sold at fair market value to the public but would be free to state, county, or other local government when used for public projects.

Management Concern: Minerals - Salable Minerals

Alternative A - No Action	Alternative B - Preferred	Alternative C	Alternative D
The BLM would authorize the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay, and petrified wood) from the federal government through a contract of sale (by the ton or cubic yard) or a free-use permit unless specific circumstances dictate otherwise. Extraction of materials from previously disturbed sites would be encouraged and all impacts to natural resources are mitigated.	The BLM would continue to authorize the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay, and petrified wood) from the federal government through a contract of sale (by the ton or cubic yard) or a free-use permit unless specific circumstances dictate otherwise. Extraction of materials from previously disturbed sites would be encouraged. All development and operating impacts to natural resources and local residence will be mitigated.	The BLM would not allow the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay and petrified wood), unless desired by the state or counties, or within existing community pits.	The BLM would authorize the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay, and petrified wood) from the federal government through a contract of sale (by the ton or cubic yard) or a free-use permit unless specific circumstances dictate otherwise.

Table 2-23
Comparison of Alternatives

Management Concern: Abandoned Mine Lands

Goals

- Reclaim AML sites on public land to improve water quality, plant communities, and diverse fish and wildlife habitat.
- Reduce and/or eliminate risks to human health from hazardous mine openings.
- Protect historic resources and wildlife habitat commonly associated with AML sites.

Management Common to All Alternatives

- To the extent possible on BLM lands, BLM would strive to meet state and federal water quality standards in watersheds impacted by historic mining.
- BLM would assess level of risks at AML sites and prioritize for reclamation based on standardized risk assessment. Reclamation would be implemented at the highest risk sites first.
- Where deemed appropriate by BLM personnel, BLM would restore severely impacted soils and watersheds as close as possible to pre-disturbed conditions that support productive plant communities and ensure properly functioning watersheds.
- Closures of dangerous inactive and abandoned mine sites would be designed to reduce the risks to human health and safety, restore the environment, and protect geological and cultural resources and meet or move toward meeting Land Health Standards.
- Restoration and reclamation activities and repositories would be monitored to determine effectiveness of reclamation practices.
- To the extent possible on BLM lands, BLM would strive to meet state and federal air quality standards in the interest of protecting human health potentially impacted by fugitive dust emissions.

Management Concern: Hazardous Materials Management

Goals

- Mitigate threats and reduce risks to the public and environment from hazardous materials.

Management Common to All Alternatives

- Disposal of hazardous materials on public lands would generally not be permitted. When the use or storage of hazardous materials is authorized (i.e. in mining operations or other types of commercial activities) special stipulations would be applied to comply with appropriate laws, regulations, and policies. In the event of hazardous materials incidents on public land, standard operating procedures would be used to respond. Cleanups and reclamation would be conducted in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan and the NEPA decision.
- BLM would promote and support the appropriate use and recycling of hazardous materials in public facilities and on public land to prevent or minimize the generation and disposal of hazardous wastes.
- Environmental Site Assessments would be conducted for land acquisitions, land disposals, and for right-of-ways if applicable. Land uses would be authorized and managed to reduce the occurrence and severity of hazardous materials incidences on public land.
- BLM would assess level of risk at hazard sites and conduct remediation at highest priority sites that are the greatest risks to the public and environment.
- Pollutants, such as flammable liquids and lubricants, would be prevented from entering streams by storing outside of riparian areas, having a spill prevention and control plan, and not allowing refueling within riparian areas (with the exception of permitted mining activities, fire suppression activities, reclamation work and chainsaw re-fueling).

Table 2-23
Comparison of Alternatives

Management Concern: Social and Economic Environment

Goals

- Provide opportunities for economic benefits while minimizing adverse impacts to resources and resource uses.
- Provide for a diverse array of activities that result in social benefits for local residents, businesses, visitors, interested citizens, and future generations, while minimizing negative social effects.
- Sustain, and where appropriate, restore the health of forest, rangeland, aquatic, and riparian ecosystems administered by the BLM to provide a sustained flow of economic benefits within the capability of the ecosystem.
- Protect visual quality, wildlife habitats, and recreation opportunities on BLM lands to sustain non-market economic values; and, make resource commodities available to provide a sustainable flow of economic benefits within the capability of the ecosystem.

Management Common to Action Alternatives (B, C, and D)

- Identified Special Recreation Management Areas and the remaining Extensive Recreation Management Areas would be managed for identified user markets, activities, and experience levels.
- Collaborative and/or stewardship processes would be used in the analysis and treatment of all resources and uses, as possible.
- BLM would provide opportunities for traditional and nontraditional uses of forest and forest products by incorporating sound ecological principles while contributing to the economic stability of the community.
- Use of new and developing technologies and industries would be encouraged in achieving healthy forest, stewardship, biomass utilization, and fuel management goals.

Management Concern: Environmental Justice

Goals

- Identify and remediate to the extent possible disproportionate negative effects to minority or low income populations per Executive Order 12898.

Management Common to All Alternatives

- Under all alternatives, BLM would evaluate and disclose whether actions would place a disproportionate share of negative environmental consequences on any particular populations covered by the Executive Order, and where practical, avoid such consequences.

Management Concern: Tribal Treaty Rights

Goals

- Accommodate treaty and legal rights of appropriate Native American groups in management of public lands.

Management Common to All Alternatives

- BLM would notify and consult with tribes on BLM actions. Consultation and coordination would be conducted on a government to government basis with federally recognized tribes.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
AIR QUA				
	Air quality would continue to be protected although short term impacts could occur from ongoing fire events, prescribed fire activities, slash burning, or dust from travel on unpaved roads, and dust and exhaust from construction or development activities.	Air quality would continue to be protected similar to Alternative A although short-term impacts from prescribed burning could be greater due to increase in potential acreage burned.	Air quality would continue to be protected similar to Alt. A although short-term impacts from prescribed burning would be less than in all other alternatives due to decrease in potential acreage burned.	Air quality would continue to be protected similar to Alt. A. Smoke from prescribed burning would be greater than any other alternative, and where fires are allowed to burn for resource benefits there could be a longer term negative impact on air quality.
SOIL RESOUR				
	Alt. A would provide no change from current conditions.	Alt. B would cause more impacts on soil resources than Alt. C, but less than Alts. A or D.	Alt. C would be most protective of soil resources and would create the least impacts of all alternatives.	Alt. D would create the greatest amount of impact to soil resources of the action alternatives.
Restoration of vegetative communities	Short- to mid-term impacts to soils from restoration of vegetative communities, and long-term benefits of restored communities would be greater than Alt. C but less than Alts. B or D.	Short to mid-term adverse effects from restoration of vegetative communities would be greater than Alts. A and C, but less than Alt. D, as would long-term benefits associated with restoration.	Short to mid-term adverse effects from restoration of vegetative communities would be the least of all alternatives, but long-term benefits would also be less.	Short to mid-term adverse effects from restoration of vegetative communities would be greatest of all alternatives, but long-term benefits would be greatest.
Livestock grazing	Greater impacts associated with livestock grazing than Alts. B or C due to availability of additional allotments.	Reduced soil impacts from grazing than Alts. A and D due to management of McMasters and, Spokane Hills as forage reserve allotments.	Least impacts from livestock grazing of all alternatives because several allotments would not be available for grazing.	Same as Alt. A.
Travel management	Greatest soil erosion potential resulting from the most miles of open motorized road.	Less ground disturbance and erosion due to road closures than Alts. A and D, but less than Alt. C.	Reduced ground disturbance associated with most motorized route closures would benefit soil more than other alternatives.	Reduction in ground disturbance from closing roads to motorized use would be greater than Alt. A, but less than Alts. B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Timber harvest/ mine development	No additional protection for soils by allowing timber harvest in SMZs.	More protection than Alts. A and D by not allowing new mining-related roads and facilities inside RMZ, unless there is no other option. Ground disturbance from timber harvest in RMZs has greater impacts than Alt. C but less than Alts. A and D.	Greater soil protection in riparian areas than other alternatives since timber harvest and mining roads/ facilities would not be allowed in RMZs.	Same as Alt. A.
Firewood management	Least long-term benefit to soils in riparian areas due to SMZ law guidance.	More beneficial than Alt. A, but less than Alt. C due to restrictions for firewood cutting within 100 feet of live streams and 50 feet of intermittent streams.	Most long-term benefit to soils in riparian areas due to restriction that firewood cannot be cut within 200 feet of live streams or 100 feet of intermittent streams.	Same as Alt. B.
WATER RESOUR				
Vegetation treatments	Short to mid-term erosion/ sedimentation impacts from ground disturbance and long-term benefits to water quality greater than Alt. C but less than Alts. B and D.	Greater effects (short-term adverse and long-term benefits) than Alts. A and C, but less than Alt. D.	Most protective from adverse effects due to least ground disturbance proposed with vegetative treatments, but least long-term benefits of all alternatives.	Greatest impacts (short-term adverse and long-term benefits) of all alternatives because highest level of vegetation treatments.
Riparian Vegetation Treatments	Negligible effects since only 30 acres riparian vegetation treated per decade.	Short-term localized erosion and sedimentation to streams from treating up to 700 acres/decade in riparian areas but long-term benefits to water quality from improved conditions.	Effects less than Alts. B and D, but more than Alternative A since 200 acres riparian vegetation treated per decade.	Most short-term adverse effects and long-term benefits of all alternatives since 1,700 acres riparian vegetation treated per decade.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
WATER RESOUR				
Fire Rehabilitation	Weed and erosion control conducted in burned areas as outlined in BLM's Emergency Fire Rehabilitation Handbook would serve to reduce erosion and subsequent stream sedimentation, though short-term impacts could occur until appropriate measures could be implemented.	More surface water protection than Alts. A and D but less than Alt. C because weed and erosion control in burned areas would only occur when stream sedimentation taking place.	Greatest benefit to surface water because weed and erosion control required anywhere accelerated erosion taking place in burned areas.	Same as Alt. A.
Livestock Grazing	Slightly greater erosion/ sedimentation and streambank stability impacts than Alts. B or C since more allotments available for grazing.	Fewer impacts than Alts. A and D since various allotments managed as forage reserves rather than general grazing.	Less impacts than Alt. B because several allotments unavailable for grazing. Least impacts of all alternatives.	Same as Alt. A.
Noxious weeds	Minimal effects to water quality expected since herbicides applied according to label directions, in accordance with National Vegetation EIS and BFO Weed Management Plan. Increase in weed infestations (more than Alt. C, but less than Alts. B and D) could increase potential for erosion and sedimentation, and thus water quality issues.	Minimal effects to water quality expected since herbicides applied according to label directions, in accordance with National Vegetation EIS, and BFO Weed Management Plan, and aerial applications would require a minimum 100-foot buffer from aquatic habitats. Increase in weed infestations under this alternative (more than Alts. A and C, but less than Alt. D) could increase potential for erosion, sedimentation, and thus water quality issues.	No effects to water quality expected since herbicides applied according to label directions, in accordance with National Vegetation EIS, and BFO Weed Management Plan, and aerial applications would not be allowed. Increase in weed infestations (least of any alternative) could still increase potential for erosion and sedimentation, and thus water quality issues.	Minimal effects to water quality expected since herbicides applied according to label directions, in accordance with National Vegetation EIS, and BFO Weed Management Plan. Increase in weed infestations (greatest of any alternative) could increase potential for erosion and sedimentation, and thus water quality issues.
Riparian management	No additional protection than afforded by SMZ law.	Alt. B more protective of water quality than Alternatives A and D due to RMZs.	Most protective because wider RMZs and no commercial timber harvest allowed.	Same as Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Water rights	No consideration given to acquiring water rights.	Increasing or maintaining in-stream flows through water rights acquisitions could benefit water quality more than Alts. A and D.	Same as Alt. B.	Same as Alt. A.
Travel management	Greatest degree of water quality impacts due to most open roads overall (629.2 miles), as well as within 300 feet of streams (94.3 miles), of all alternatives.	Fewer impacts to water quality than Alts. A and D due to second lowest number of open roads (416.8 miles) overall, and within 300 feet of streams (77.4 miles) of all alternatives.	Lowest impacts to water quality of any alternative due to fewest open roads (372.4 miles). Fewest open roads within 300 feet of streams (73.7 miles) of all alternatives.	Fewer water quality impacts than Alt. A but more than Alts. B and C. Second highest number of open roads (478.6 miles) and roads within 300 feet of streams (81.2 miles) of all alternatives.
Road design and maintenance standards	Least protective of water quality of all alternatives.	More protective than Alt. A, because roads minimized in RMZs, outsloping surfaces, routing drainage away from streams, and culvert stream crossings.	More protective than all other alternatives because 100-year storm event culverts would be installed at stream crossings.	Slightly less protective than Alt. B due to fewer design and maintenance considerations.
Special designations	Provides equal protection of NWSRS-eligible segments as Alt. C by limiting activities within a 0.25 mile corridor of all four segments (12 miles). Spokane Creek aquatic resource values within 14-acre area not protected with ACEC designation.	More protective than Alternative D, but less than Alternatives A and C since only two river segments considered for NWSRS. More protective than Alts. A and D in Spokane Creek due to its designation as ACEC.	Same as Alt. A for NWSRS suitability. Same as Alternative B for Spokane Creek ACEC designation.	Less water quality protection than other alternatives since no rivers recommended suitable for NWSRS. Spokane Creek not designated as potential ACEC.
Oil and gas leasing	Effects of NSO restrictions more protective for perennial streams and rivers than other alternatives. Standard lease terms less protective of municipal watersheds than other alternatives.	More protective of municipal water supplies than Alts. A and D due to NSO stipulation in municipal watersheds.	Most protective of municipal watersheds with no leasing of oil and gas allowed in municipal watersheds.	Controlled Surface Use stipulation less protective of municipal watersheds than Alts. B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
WATER RESOUR				
Mining operations	Most water quality impacts because new roads and facilities would be allowed in riparian areas.	More protective than Alts. A and D, because new roads and facilities would not be allowed in riparian areas unless there is no other option.	Most protective of all alternatives because new mining roads and facilities prohibited in riparian areas.	Same as Alt. A.
Mineral withdrawals	No proposed withdrawal in Muskrat Creek drainage	Same as Alt. A.	Would protect westslope cutthroat trout population, stream channel, and water quality associated with mining impacts by proposing a withdrawal from mineral entry of 180 acres of riparian areas in the Muskrat Creek drainage.	Same as Alt. A.
VEG				
General vegetation				
Livestock grazing	Biomass on allotments would be reduced on 273,000 acres available for grazing. Density and production of palatable species may be reduced in localized areas. The reduction in fine fuels would reduce frequency and intensity of wildland fire.	Grazing effects would occur on 265,000 acres. Fine fuels buildup and some grass species decadence may occur on 8,000 additional acres unavailable for grazing.	Grazing effects would occur on 262,000 acres. Fine fuels buildup and some grass species decadence may occur on 11,000 additional acres unavailable for grazing.	Same as Alt. A.
Revegetation seed mix	Revegetation seed mixes consist of mostly native species.	Using native species or non-invasive seed mixes on burned areas and sites with high erosion potential would minimize proliferation of noxious weeds. Perennial non-native species may initiate persistent stands,	Using only native species for revegetation of disturbed areas would require intense management for weed control but long-term benefits of little or no maintenance once they are established. The slope stabiliz-	Same as Alt. B

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
		which can inhibit colonization by native herbaceous species and conifers.	ing, quick ground cover, and invasive species competition of introduced species would be foregone.	
Permanent Roads	No set road density target for areas in big game winter and calving ranges. The existing road network would remain open for public use. Provides greatest flexibility for vegetation treatments.	No new, permanent roads would be allowed in big game winter range or calving habitat where road densities are 1 mi/mi^2 or less. Vegetation treatment options could be limited more than Alt. D but less than Alt C.	No new, permanent roads in big game winter range and calving areas where road densities where are 1.5 mi/mi^2 or less. This is most restrictive of all alternatives for vegetation treatments.	No new, permanent roads would be allowed in big game winter range or calving habitat where road densities are 0.5 mi/mi^2 or less. Vegetation treatments would be limited more than Alt. A, but less than Alts. B and C.
Protection of raptor nests	Alt. A would provide no limitations to vegetation treatments associated with occupied raptor nests.	Alt. B would restrict noise disturbance and most management activities within 0.5 miles of occupied raptor nests, during the nesting and brooding period. Approximately 500 acres per nest would be affected, making management more difficult.	Alt. C would restrict noise disturbance and most management activities within 1 mile of occupied raptor nests, during the nesting and brooding period. Affects approximately 2,000 acres per nest, four times as many acres as Alt. B and sixteen times as many acres as Alt. D.	Alt. D would restrict noise disturbance and most management activities within 0.25 miles of occupied raptor nests. Approximately 125 acres per nest would be affected, making management more restrictive than Alt. A, but less than Alts. B and C.
Grassland and Shrubland				
Vegetation treatments	Would treat 5,250 acres per decade resulting in a net increase in conifer encroachment of approximately 1,161 acres per decade.	Would restore up to 15,450 acres per decade of grassland and shrubland communities for a net restoration (decrease in conifer encroachment) on up to 9,039 acres per decade.	Would treat up to 2,750 acres per decade resulting in net increase in conifer encroachment rather than an increase in restored habitat compared to Alts. B and D.	Would treat up to 25,900 acres per decade resulting in greater net increase in restored habitat (up to 19,489 acres per decade) than all other alternatives.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
VEG				
Fire management (Prescribed fire)	Would reduce fuel loading and remove encroaching conifers.	Projects planned to reduce density of conifer seedlings and saplings on 80 percent of area burned leaving conifer encroachment in mosaic of unburned patches.	Projects planned to burn least surface area (60 percent) to treat conifer encroachment.	Projects planned to burn 90 percent of surface area would be burned to reduce conifer encroachment.
	No timing restrictions for prescribed burning.	Soil, grasses, and forbs protected from fire-related mortality during hotter drier months by imposed burning restrictions May-August.	Timing restriction for prescribed burning the similar to Alt. B, but includes mechanical treatments as well, and therefore is most restrictive.	Same as Alt. A.
	Rest from livestock grazing in grassland/shrubland habitats before and after burning as determined through site-specific planning.	Resting areas from livestock grazing in grassland/shrubland habitats up to one year prior to treatment and two growing seasons following treatments (with case by case flexibility) would promote vegetative recovery before reapplying grazing.	Same as Alt. B but without flexibility to reduce post-treatment rest timeframe. Limited flexibility to meet permittee forage needs.	Rest prior to burning if needed and for one growing season after, additional rest on case-by-case basis. Vegetation recovery may occur more slowly. More flexibility to meet permittee forage needs.
Mountain mahogany and bitterbrush restoration	No proactive restoration proposed.	Treatment of mahogany and bitterbrush would be a priority. Vigor and health of these species would be improved compared to Alts. A and C through treatments reducing competing plants.	Would provide for opportunistic restorative treatments of mountain mahogany and bitterbrush communities when associated with other projects. Effects would be the same as Alts. B and D, but would occur on fewer acres.	Same as Alt. B.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Forests and woodlands				
Dry forest treatments	Least acres of dry forest treated per decade (5,100 acres) to help restore historic conditions and still exceed rate of decline in forest health.	Second most acres of dry forest treated per decade (up to 14,750 acres) to help restore historic conditions that would exceed rate of decline in forest health.	At a treatment rate of up to 4,800 acres per decade, dry forest would not be restored at a rate exceeding rate of decline in forest health.	Most acres of dry forest treated per decade to restore historic conditions (up to 18,200 acres per decade) of all alternatives.
Cool, moist forest treatments	Least acres of cool, moist forest treated per decade (2,350 acres) to help restore historic conditions and still exceed rate of decline in forest health.	Second most acres of cool, moist forest treated per decade (up to 3,750 acres) to help restore historic conditions that would exceed rate of declining forest health.	At a treatment rate of up to 550 acres per decade, cool moist forest would not be restored at a rate exceeding rate of decline in forest health.	Most acres of cool, moist forest treated per decade to restore historic conditions (up to 5,050 acres per decade) of all alternatives.
Big Game Security Cover	Guidelines from the Montana Cooperative Elk-Logging Study (Lyon et al. 1982) can be considered on a case-by case basis, as compared to action alternatives which specify core acreages that must remain unroaded or closed during the hunting season. Provides greatest flexibility for implementation.	Maintaining 250 acre blocks for big game security cover would restrict vegetation treatment options more than under Alternative A, but would still provide some flexibility.	Same as Alt. B	Same as Alt. B.
Old forest structure	No specific limitations associated with maintaining old forest structure.	Maintain and promote old forest structure through active restoration treatments and activities. More proactive than Alts. A and C.	Maintain and protect old forest structure. Management would be more reactive than proactive, unlike Alts. B and D.	Same as Alt. B.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
VEG				
Unoccupied raptors nests	No specific limitations on treatments associated with maintaining habitat around unoccupied raptor nests.	Maintain a 0.25 mile buffer (~125 acres) of suitable habitat around unoccupied nests for 5 years. Less restrictive than Alt. C but more so than Alts. A and D.	Maintain a 0.5 mile buffer (~500 acres) of suitable habitat around unoccupied nests for 7 years. Most restrictive of all alternatives.	Maintain a 0.25 mile buffer (~125 acres) of suitable habitat around unoccupied nests for 3 years. Least restrictive of the action alternatives.
Noxious weeds				
Potential spread	Management under Alt. A could result in the lowest rate of potential weed spread, though infested acres could still increase (43,000 acres by 2015).	Management under Alt. B could result in the third lowest rate of potential weed spread (48,000 acres by 2015).	Management under Alt. C could result in the highest rate of potential weed spread (51,000 acres by 2015).	Management under Alt. D could result in the second lowest rate of potential weed spread (47,000 acres by 2015).
Weed spread contributions	Open and limited roads and trails would contribute 13 acres/year, grassland treatments 66 acres/year, forest treatments 38 acres/year, and riparian treatments would be negligible contributors.	Open and limited roads and trails would contribute 9 acres/year, grassland and shrubland treatments 193 acres/year, forest treatments 93 acres/year, and riparian treatments would be negligible contributors.	Open and limited roads and trails would contribute 8 acres/year, grassland and shrubland treatments 34 acres/year, forest treatments 27 acres/year, and riparian treatments would be negligible contributors.	Open and limited roads and trails would contribute 10 acres/year, grassland and shrubland treatments 323 acres/year, forest treatments 116 acres/year, and riparian treatments 9 acres/year.
	Spread from wildfire is not included in the increased acres, and wildfire risk is greater than Alts. B and D but less than Alt. C.	Spread from wildfire is not included in the increased acres, and wildfire risk is greater than Alt. D but less than Alts. A and C.	Spread from wildfire is not included in the increased acres, and wildfire risk is the greatest under this alternative.	Spread from wildfire is not included in the increased acres, and wildfire risk is the least under this alternative.
Oil and gas development	Weed spread from oil and gas development would be similar to Alt. B, greater than Alt. C, and less than Alt. D.	Weed spread from oil and gas development would be similar to Alt. A, greater than Alt. C, and less than Alt. D.	Weed spread from oil and gas development would be least under this alternative.	Weed spread from oil and gas development would be greatest under this alternative.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Lakeside Camping	Weed spread from camping on Holter and Hauser Lakes would be greater than Alts. B and C but the same as Alt. D.	Weed spread from camping on Holter and Hauser Lakes would be greater than Alt. C but less than Alts. A and D.	Weed spread from camping on Holter and Hauser Lakes would be least under this alternative.	Same as Alt. A.
Grassland and Shrubland treatments	Grassland treatments could result in up to 4,000 acres/decade of weed resistant plant communities. No shrubland treatments are anticipated.	Grassland and shrubland (combined) treatments could result in up to 12,000 acres/decade of weed resistant plant communities.	Grassland and shrubland (combined) treatments could result in up to 2,000 acres/decade of weed resistant plant communities.	Grassland and shrubland (combined) treatments could result in up to 19,000 acres/decade of weed resistant plant communities.
Aerial treatment restrictions	Aerial treatment restrictions would result in greater costs per mile of riparian treatments than Alt. D, but less than Alts. B and C.	Aerial treatment restrictions would result in greater costs per mile of riparian treatments than Alts. A and D, but less than Alt. C.	Aerial treatment restrictions would result in the greatest costs per mile of riparian treatments.	Aerial treatment restrictions would result in the least cost per mile of riparian treatments.
Riparian types				
Riparian protection	SMZs provide protection to water quality, streambank stability, down woody material and shade by restricting certain forest activities on 3,528 acres.	Increased stream shading, increased down woody material recruitment, and wider vegetative "filters" to prevent eroded sediment from reaching streams on 5,312 acres in RMZs.	Increased stream shading, increased down woody material recruitment, and wider vegetative "filters" to prevent eroded sediment from reaching streams on 11,393 acres in RMZs.	Same as Alt. A.
Riparian restoration	Mechanically treating 30 acres per decade would require the longest timeframe to restore riparian vegetation communities to proper functioning condition.	Mechanically treating up to 700 acres per decade would require the second shortest timeframe to restore riparian vegetation communities to proper functioning condition.	Would require second longest timeframe to restore riparian vegetation communities to proper functioning condition at up to 200 acres per decade of mechanical treatments.	Treating up to 1,700 acres per decade, could allow the shortest period required to restore riparian vegetation communities to proper functioning condition of all alternatives.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
VEG				
Noxious weeds	Adhering to application standards during aerial spraying, including a 200' buffer along riparian areas, would protect untargeted riparian vegetation.	Adhering to application standards during aerial spraying would protect untargeted riparian vegetation, though there would be more risk of inadvertent herbicide application given the minimum buffer of 100 feet in riparian areas. Cost of treating weeds and risk of noxious weed spread in riparian areas would be less than Alternatives A or C.	Least risk of inadvertent herbicide application to untargeted riparian vegetation, since no aerial spraying is allowed, but least progress in minimizing weeds in these habitats. Cost of treating weeds would be the highest of all alternatives.	Adhering to application standards during aerial spraying would protect untargeted riparian vegetation. Alt. D would allow flexibility in weed control options based on 100 foot application buffer in riparian areas, and thus potential to better control weed infestation and spread. Low cost of treatment like B, but greater risk of inadvertent herbicide application than Alts. A and C.
Special designations	Some protection of riparian vegetation from potential future land use disturbances such as utility corridors, timber harvest, or mining since 12 river miles would be managed to maintain WSR eligibility.	Increased protection of riparian vegetation over Alt. A since 5.7 miles of river/stream segment recommended for WSR designation.	Most protection of riparian vegetation of all alternatives since 12 miles of river/stream recommended suitable for WSR designation. Additional 14 riparian acres in ACEC designation (Spokane Creek).	Least protection of riparian vegetation of all alternatives since no rivers recommended for WSR designation. Spokane Creek ACEC would not be designated.
Lands and realty	No mineral withdrawal proposed for Muskrat Creek	Same as Alts. A and D.	Muskrat Creek's sensitive riparian values and vegetation protected from potential mining impacts by 180 acre withdrawal.	Same as Alts. A and B.
Mine-Related Road construction	No provisions in place for restricting mine-related roads in riparian areas.	Reduced impacts to riparian vegetation from Alt. A by not allowing mining roads and facilities in riparian areas unless no other option exists.	Least impacts of all alternatives since no mining-related road or facilities allowed in riparian areas.	Same as Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Oil and gas leasing	Disturbance of riparian vegetation limited by NSO within 500 feet of reservoirs, lakes, ponds, and intermittent streams. Disturbance of riparian vegetation limited by NSO within 1,000 feet of perennial streams and rivers.	Similar protection as Alt. A for reservoirs, lakes, ponds, and intermittent streams due to flexibility under Standard Lease Terms to move facilities up to 656 feet. Slightly less protection of vegetation along perennial streams and rivers compared to Alt. A due to lack of 1,000 foot NSO stipulation but still with flexibility to move facilities up to 656 feet.	Same as Alt. B.	Same as Alt. B.
WILD				
Dry forest habitats	Alt. A would restore fewer acres (up to 5,100 acres/decade) of habitat for those species that depend on dry forest types than Alts. B and D but could restore up to 300 acres more per decade than Alt. C.	Alt. B would restore more habitats for species that depend on dry forest types (up to 14,750 acres/decade) than Alts. A and C but 3,450 acres less per decade than Alt. D. Alternative B would have fewer short-term adverse effects on wildlife than Alt. D.	Alt. C would restore the fewest acres of dry forest types (up to 4,800 acres/decade) of all alternatives. Alt. C would have the fewest short-term adverse effects on wildlife from disturbance and road construction.	Alt. D would restore the most acres of dry forest types (up to 18,200 acres/decade) of all alternatives and considerably improve habitat for a variety of wildlife species. Alt. D would have the most short-term adverse effects on wildlife from disturbance and road construction.
Cool, moist forest habitats	Alt. A would restore fewer acres (up to 2,400 acres) of habitat for those species that depend on cool, moist forests than Alts. B and D but could restore up to 1,850 acres more per decade than Alt. C.	Alt. B would restore more habitat for cool forest species (up to 3,750 acres/decade) than Alts. A and C but up to 1,300 acres less than Alt. D. Alt. B would have fewer short-term adverse effects to wildlife than Alt. D.	Alt. C would restore the fewest acres of cool forest (up to 550 acres/decade) of all alternatives. Alt. C would have the fewest short-term adverse effects on wildlife of all the alternatives.	Alt. D would restore the most acres of cool forest (up to 5,050 acres/ decade) of all alternatives and improve more habitat for a variety of wildlife species. Alt. D would have the most short-term effects on wildlife from disturbance and road construction.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
WILD				
Snag management	Alts. A and D would not provide retention guidelines for snag and down woody habitat and would not proactively create snags in snag deficient areas. Alts. A and D would protect less snag habitat than Alts. B and C.	Alts. B and C would both use the same protocol to identify the range of natural variability for retention or creation of snags. Unlike Alts. A and C, Alt. B would actively create snags in snag deficient areas.	Alternative C could create less snag habitat over long-term than Alt. B due to opportunistic snag creation rather than active management.	Same as Alt. A.
Timber Salvage	Alt. A would have no restrictions on the number of acres or size of trees removed with timber salvage. Under Alt. A, snag habitat and down wood, which provides breeding and foraging for a variety of species, would decline more rapidly than under the action alternatives.	Contiguous blocks of dead and dying forest would be retained in adequate amounts during timber salvage under Alt. B. Alt. B would retain more habitat for species dependent on dead and dying forests compared to Alts A and D but less than Alt. C.	By retaining 50 percent of dead and dying forest during salvage where these areas exceed 1,000 acres, Alt. C would ensure the most acres available to species dependent on snag habitat. Alt. C would ensure breeding and nesting habitat is available in adequate amounts to maintain viability of species dependent on this habitat type.	Alt. D would retain fewer acres of dead and dying forest (30 percent in areas that exceed 1,000 acres) during salvage compared to Alt. B and, especially, Alt. C. This would ensure that some habitat is maintained for species dependent on dead and dying forest but may not ensure the long-term viability of these species.
Firewood cutting	Alt A would have no restrictions on the size of snags taken or where snags are removed. This would reduce breeding and foraging habitat for many species more than the action alternatives.	Restricting the size of snags taken would protect more breeding and nesting habitat than Alt. A but less than under Alt. C.	Alt. C would protect more snag and down woody habitat of all alternatives by only allowing firewood cutting in designated areas to meet resource objective and only allowing trees <20" DBH to be removed.	Same as Alt. B.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Grassland/Shrubland habitats	Unlike the action alternatives, Alt. A only proposes treating grasslands (up to 5,250 acres/decade) and not sagebrush. Alt. A would restore fewer acres of grassland and shrublands for those species that depend on these habitat types compared to Alts. B and D but could restore up to 3,250 more grassland acres per decade than Alt. C.	Alt. B would restore and enhance considerably more habitat for grassland and shrubland species (up to 15,450 acres/decade) than Alts. A and C but up to 10,400 acres less than Alt. D. However, Alt. B would have fewer short-term adverse effects to wildlife than Alt. D.	Alt. C would restore the fewest acres of grassland (up to 2,000 acres/decade) of all alternatives and less shrubland (up to 750 acres/decade) than Alts. B and D but more than Alt. A. Alt. C would restore considerably fewer acres of grassland/shrubland habitats than Alts. B and D causing a decline in the quality and quantity of habitat for grassland and sagebrush species. Alt. C would have the fewest short-term adverse effects on wildlife of all the alternatives.	Alt. D would restore and enhance the most acres of grassland/shrubland (up to 25,850 acres/decade) of all alternatives and improve more habitats for grassland/shrubland species. Alt. D, however, would have the most short-term adverse effects on wildlife from disturbance and temporary road construction.
Firewood cutting in Riparian Areas	With no restriction on firewood cutting in riparian areas, Alt. A would have the most detrimental effects to riparian species from the loss of breeding and nesting habitat.	Alt. B would maintain more breeding and nesting habitat in riparian areas by restricting firewood cutting within 100 feet of live streams and within 50 feet of intermittent streams.	Alt. C would provide the greatest protection to breeding and nesting riparian wildlife species of all alternatives by not allowing firewood cutting within 200 feet of live streams and within 100 feet of intermittent streams.	Same as Alt. B.
Riparian habitat protection	Under Alts. A and D, riparian areas would be given a minimum amount of protection through the use of SMZs. SMZs allow activities such as logging, prescribed fire, and road building in riparian areas (50 feet on either side of a stream) but restricts how many trees can be removed and where road construction can occur.	Alts. B and C would establish riparian management zones (RMZs) where all activities would have to meet riparian goals and objectives. The RMZ width would vary depending on the type of stream (80 feet for perennial streams and 160 feet for fish bearing streams).	Alt. C would ensure the best protection of riparian and stream habitats by requiring all activities with 150 feet of perennial and 300 feet of fish bearing streams meet riparian goals and objectives. Alt. C would protect more riparian habitat for terrestrial species than all other alternatives.	Same as Alt. A

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
WILD				
	SMZs provide limited protection to overall riparian function and habitat diversity to terrestrial species. By focusing dead and live tree retention within the first 50 feet of stream and by allowing smaller diameter trees to be retained (down to 8 inches DBH), SMZs would limit wood recruitment to streams, reduce habitat for foraging and breeding (less vegetation and smaller diameter snags retained), reduce hiding and brood rearing habitat as well as limit effective wildlife movement corridors.	The emphasis in riparian and stream functions along with wider RMZs would ensure that riparian habitat is maintained along streams not only for water quality and aquatic habitat but also for the numerous terrestrial wildlife species that use riparian areas for breeding, foraging and hiding as well as for movement corridors.		
Noxious weeds	Continued degradation of grassland, shrubland, riparian and forested habitats with a reduction in forage, hiding cover, and vegetative diversity due to the fewest acres treated of all alternatives. Alt. A would provide more protection to non-target vegetation compared to Alt. D by not allowing aerial spraying within 200 feet of streams.	Assuming implementation of the high end of proposed weed treatment acres, Alt. B would treat more weeds than Alts. A and C but less than D. Alt. B would restore more habitat than Alts. A and C but less than D. Alt. B would provide the same protection from non-target species as Alt. D by not allowing aerial spraying within a minimum of 100 feet of streams.	Assuming implementation of the high end of proposed weed treatment acres, Alt. C would treat and restore more acres of weeds than Alt. A but substantially less than Alts. B and D. Alt. C would provide the most protection of non-target vegetation of all alternatives by not allowing aerial spraying. Alt C could allow weed infestation to rapidly spread in hard to access sites by not allowing aerial spraying.	Assuming implementation of the high end of proposed weed treatment acres, Alt. D would restore more habitats for a diversity of species compared to the other alternatives by reducing noxious weed infestations. Alt. D would protect the least amount of non-target vegetation by allowing aerial spraying within 100 feet of streams.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Livestock grazing	Alt. A would have more acres available to livestock grazing than Alts. B and C (273,000) and the same as Alt. D. Alternatives A and D could have more negative effects due to competition between livestock and big game for forage, spread of noxious weeds, decrease in quality and quantity of grassland/shrubland habitat and loss of riparian habitat than Alts. B and C.	Alt. B would reduce the existing acres available for livestock grazing to 265,000 acres and potentially increase the quality and quantity of habitat for big game as well as nesting and foraging habitat for a variety of grassland/shrubland and riparian species compared to Alts. A and D. Annual maintenance of exclosures would ensure riparian areas are not degraded from livestock grazing or trampling.	Alt C would allow the fewest acres of livestock grazing (262,000 acres) compared to all other alternatives. This would benefit the most wildlife species by reducing competition for forage, reducing disturbance, preventing spread of weeds, protecting riparian areas, and protecting nesting and cover habitat. Annual maintenance of exclosures would ensure riparian areas are not degraded from livestock grazing or trampling.	Same as Alt. A on allowable acres for livestock grazing but more effects from reduced maintenance of livestock exclosures expected (exclosures to be maintained every 5 years). However, damaged and non-functional exclosures could allow access to riparian areas and streams between 5 year maintenance intervals. Due to this, Alternative D would provide less protection to riparian areas than Alternatives B and C.
Bighorn sheep management	For new sheep/goat allotments or conversions from cows to sheep/ goats, although Alts A and D would allow for a buffer of up to 9 miles between wild and domestic sheep, these alternatives would not have a minimum buffer width. These Alts. would not guarantee adequate separation between wild and domestic sheep to prevent disease transmission. Alt. A would not provide specific guidance when using domestic sheep for weed control in occupied bighorn sheep habitat. This could allow for disease transmission to wild sheep during weed control activities.	For new sheep/goat allotments or conversions from cows to sheep/ goats, Alt. B would require a minimum buffer width of 5 miles between wild and domestic sheep populations to reduce the potential for diseases to be passed from domestic to bighorn sheep. Alts. B and C would not allow new sheep or goat allotments in occupied bighorn sheep habitat to protect wild sheep from disease transmission. Alts. B, C, and D would restrict when and for how long domestic sheep could be used for weed control adjacent to occupied wild sheep habitat.	For new sheep/goat allotments or conversions from cows to sheep/ goats, Alt. C would have the greatest protection to bighorn sheep from disease transmission and competition of resources due to the largest mandatory buffer (9 miles) between wild and domestic sheep. Alt. C would also have the most restrictions on when domestic sheep could be used for weed control and would not allow new sheep or goat allotments in occupied bighorn sheep habitat.	For new sheep/goat allotments or conversions from cows to sheep/ goats, Alt. D would have the same direction for a buffer between domestic sheep and goat allotments and wild sheep habitat as Alternative A, but would have the same restrictions as Alt. B for the use of domestic sheep and goats during weed control adjacent to wild sheep habitat. Alt D would protect bighorn sheep from disease slightly more than Alt. A but considerably less than Alts. B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
WILD				
Fire Management	Alts. A and D would have more mortality to nesting migratory and resident birds compared to Alts. B and C because there would be no timing restrictions during prescribed burning or mechanical treatments.	Alt. B would reduce mortality to nesting birds, including migratory and resident birds, by excluding the use of fire during the breeding season. Because mechanical treatments would not have timing restrictions, there could be impacts to breeding birds from implementation during the breeding season. Alt. B would protect breeding birds and prevent more mortality than Alts. A and D but less than Alt. C.	Alt. C would prevent the most mortality to migratory and resident breeding birds by restricting both prescribed fire and mechanical treatments during the breeding season.	Same as Alt. A.
Travel management	Alt. D would have the most miles of open yearlong roads (471.8 miles) of all alternatives. Alt. D would have the most detrimental effects on wildlife from disturbance or loss of habitat for overwintering, breeding, and migrating wildlife. Alt. A would have more roads that could cause direct mortality through road kill, prevent wildlife movement, create disturbance, cause spread of noxious weeds, and cause habitat fragmentation across the landscape. Alt. A would have more detrimental effects to wildlife from cross-country snowmobile use	Alt. B would have substantially fewer detrimental effects to wildlife from open yearlong roads (263 miles) compared to Alt. A. Alt. B would also have fewer negative effects to wildlife from loss of habitat, road kill, disturbance and fragmentation of habitat than Alt. D but more than Alt. C. Alt. B would have considerably fewer acres available for cross-country snowmobile use	Alt. C would have the least negative effects to wildlife from open roads because no new permanent roads would be constructed for forest treatments and because Alt. C would have the most closed and seasonally restricted roads. Alt. C would have 244.3 miles of open yearlong roads, considerably less than Alts. A and D and 13.3 miles less than Alt. B. Alt. C would have substantially fewer detrimental effects to wildlife from cross-country	Alt. D would improve wildlife habitat and reduce disturbance over Alt. A with 304.8 miles of open yearlong roads but would restore much fewer acres and allow considerable disturbance over Alts. B and C. Alt. D would allow 139,138 acres to be open to cross country snowmobile use, considerably

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
	on 143,206 acres compared to the other alternatives. Alt A would allow more harassment of wildlife during seasons of high stress. This could lead to individuals leaving an area and/or cause an increase in stress that could lead to mortality.	(112,682 acres) compared to Alt. A. Alt B would protect more wildlife from harassment and stress due to snowmobile use than Alts A and D but substantially less than Alt. C.	snowmobile use of all alternatives. Alt C would allow cross-country snowmobile use on 26,148 acres.	more than Alts. B and C, but 4,068 acres less than Alt. A. Alt. D would have the greatest negative effects from harassment, displacement and an increase in stress to wildlife from snowmobile use of the action alternatives, but would have fewer effects than Alternative A.
Big game winter range habitat	Actual road densities in winter range for Alt. A would be greater than 1 mi/mi^2 in all five travel plan areas being analyzed in RMP. Road densities above 1 mi/mi^2 can have substantial detrimental effects to big game through loss of habitat, disturbance, an increase in stress, and an increase in vulnerability to direct mortality (road kill and hunting). No minimum size of unroaded forested habitats identified to be protected as big game security habitat under Alt. A. Based on existing blocks of security habitat 250 acres or greater in size, Alt. A would provide 5,846 acres of security habitat Decision Area-wide.	Alt. B would provide greater protection and larger blocks of effective big game habitats than Alts. A and D by having road densities below 1.0 mi/mi^2 in winter range of all five travel plan areas being analyzed. Alt. B would further protect big game habitat over Alts. A and D by restricting new road construction in areas where open road densities are 1.0 mi/mi^2 or less. Alt. B would have substantially more functional big game security habitat than Alt. A by retaining blocks (>250 acres) of forested habitats as unroaded or with closed roads during the hunting season. Alt. B would provide 8,510 acres of security habitat Decision Area-wide.	Alt. C would provide the most protection and the largest blocks of effective big game habitat of all alternatives by reducing road densities within winter range in all five travel plan areas to 0.8 mi/mi^2 or less. Alt. C would further protect big game habitat more than all other alternatives by restricting new road construction in areas where open road densities are 1.5 mi/mi^2 or less. Alt. C would ensure the greatest amount of functional big game security habitat of all alternatives by retaining blocks (>250 acres) as unroaded or with closed roads during the hunting season. Alt. C would provide 10,946 acres of security habitat Decision Area-wide.	Alt. D would create larger blocks of big game habitat over Alt. A, but fewer acres compared to Alts. B and C. Road densities within winter range of the five travel plan areas being analyzed would be 1.2 mi/mi^2 or less. Alt. D would continue to reduce effective big game habitat because new road construction would be restricted in areas where open road densities are 0.5 mi/mi^2 or less. Alt. D would provide more security habitat than Alt. A, but less than Alts. B and C. Alt. D would provide 7,007 acres of security habitat Decision Area-wide.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
WILD				
Wildlife movement corridors	Habitat fragmentation and isolation of populations as a result of degradation of movement corridors can result in small, vulnerable populations. Disturbance related to high road density within wildlife corridors can degrade the quality of wildlife corridors, eventually making them unavailable to wildlife species that depend on them. Alt. A would have the fewest acres of wildlife movement corridors with low road densities (99,137 acres).	Alt. B would substantially improve the quality of wildlife movement corridors over Alt. A by increasing the acreage with low road densities to 114,086 acres.	Alt. C would provide the most connectivity and the least amount of habitat fragmentation of all alternatives by providing the most acreage with low road densities in wildlife movement corridors at 117,469 acres.	Alt. D would have the least amount of connectivity and the lowest quality movement corridors (109,796 acres with low road densities) compared to Alts B and C, but would have higher quality corridors compared to Alt. A.
Special designations	Alt. A would continue management of the Sleeping Giant ACEC but would not propose any new ACECs. Under Alt. A, WSAs would revert back to multiple use management if not designated as wilderness. If the existing MOU in the Elkhorn Mountains is withdrawn, this area would also revert to multiple use management. Alt. A would have the fewest acres managed for wildlife goals and objectives through the special designations compared to all other alts.	Alt. B would propose four ACECs. The two new ACECs that would benefit wildlife the most under Alt B would be Humbug Spires and, especially, Elkhorns. If the WSA designation is withdrawn for Humbug Spires, the ACEC would ensure habitat for many dry forest, riparian and cliff species would be protected in this unique area. The Elkhorn ACEC would consist of 50,431 acres in and around the Elkhorn Mountains but would exclude the Limestone Hills National Guard Training Area, Radersburg motorized play area and small iso-	Under Alt. C, the benefits to wildlife from ACECs would be similar to Alt. B with the exception of the Elkhorn ACEC. Under Alt. C, the Elkhorn ACEC would consist of all BLM lands in and around the Elkhorns (67,665 acres). Alt. C would ensure that all BLM acres in the Elkhorn Mountains would be managed over the long-term specifically for wildlife.	Alt. D would propose new ACECs. The Humbug Spires ACEC would be the same as Alts B and C. Under Alt. D, the Elkhorn ACEC would only include the existing WSA boundary (3,575 acres). This would be substantially different from Alts. B and C. If the existing MOU is withdrawn under Alt. D, the majority of BLM lands in the Elkhorn Mountain Range would revert to multiple use management. This would be detrimental to wildlife in this unique area.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
		lated parcels along the western boundary. This ACEC would have long-term benefits to wildlife by focusing management specifically for wildlife. Substantially more acres would be proposed under this alternative than under Alt. D.		
Recreation	No food storage restrictions would be in place at recreation sites to protect bears from being moved or destroyed.	Alt. B would protect bears from being moved or destroyed by implementing food storage restrictions at recreation sites.	Same as Alt. B.	Same as Alt. A
Oil and gas leasing	All big game winter and calving habitat in the five areas with most potential for oil and gas development would be protected with timing restrictions. Timing restrictions would be the same for Alt. A, B, and D in big game winter/spring habitat. Timing restrictions would allow habitat to be lost and would allow some disturbance to big game during development. Wildlife management areas (state lands) would be the most protected of the action alternatives with NL and NSO stipulations.	Alt. B would use NSO to protect wildlife management areas (same as Alt. D) and in bighorn sheep core habitat. Alt. B would ensure habitat is not lost and sheep not disturbed in core areas. This is more protective than Alts. A and D. Alt. B would also use timing restriction in other big game habitats (calving/birthing areas) but they would be more restrictive than under Alts. A and D. This would give big game more refuge during the calving season and also reduce stress during the winter and spring seasons.	Alt. C would provide complete protection to big game from loss of habitats or disturbance by using a NL stipulation in big game habitat and in wildlife management areas.	Alt. D would be similar to Alt. A and Alt. B in protecting big game. This Alt. would provide more refuge to bighorn sheep by having a longer time restriction during the winter and spring than Alt. A. Alt. D would have less protection to bighorn sheep than Alts B and C only using a timing restriction in core habitat. Timing restrictions would allow habitat to be lost and would allow disturbance to bighorn sheep core habitat during development.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
FI				
Riparian Function	Under Alt. A and D, riparian areas would be given a minimum amount of protection through the use of SMZs. SMZs allow activities such as logging, prescribed fire, and road building in riparian areas (generally 50 feet on either side of a stream) but restricts how many trees can be removed and where road construction can occur. Although this would provide some protection to streams, the loss of riparian vegetation and soil disturbance could cause negative impacts to streams from increased runoff, loss of large woody material, loss of riparian vegetation and sedimentation.	Alts B and C would establish riparian management zones (RMZs) where all activities would have to meet riparian goals and objectives. The RMZ width would vary depending on the type of stream (80 feet for perennial streams and 160 feet for fish bearing streams). The emphasis in riparian and stream functions along with wider RMZs would ensure that riparian and stream habitats and functions are maintained for the long-term.	Alt. C would ensure the most protection of riparian and stream habitats by requiring all activities with 150 feet of perennial and 300 feet of fish bearing streams meet riparian goals and objectives. Alt. C would protect more riparian habitat for aquatic species than all other alternatives.	Same as Alt. A
Wildland fire suppression	Alts. A and D would not require fish screens when removing water during fire suppression. This could cause direct mortality of fish.	Alt. B would prevent mortality to fish by requiring fish screens are used when removing water from streams.	Same as Alt. B.	Same as Alt. B.
Watershed function	Watersheds with the highest road densities often have lower quality and less functional habitat available for fish. Alt A would have the most BLM acres with high road densities (>2 mi/mi^2) of all alternatives (107,566 acres).	Alt. B would improve the overall function of watersheds and the quality of fish habitat by reducing acres with high road densities to 87,729 acres compared to Alt. A. Alt B would have fewer acres with high road densities compared to Alt. D but more than Alt. C.	Alt. C would substantially improve overall watershed functions and aquatic habitats by having the fewest acres with high road densities of all alternatives (81,196 acres).	Alt D would improve watershed functions more than Alt. A with 95,481 acres in high road densities but would allow more detrimental effects to aquatic habitats from high road densities compared to Alts. B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Riparian roads	Road crossings and roads that are adjacent to streams can result in loss of riparian vegetation, loss of large woody material to streams, increased sedimentation, direct stream channel alteration, and barriers to fish movement. Alt. A would have the most miles of open roads in riparian areas (94.3 miles) of all alternatives.	Alt. B would allow improvement in riparian vegetation and decrease sedimentation and runoff to streams more than Alts. A and D with 77.4 miles of open roads in riparian areas.	Alt. C would have the greatest benefit to fish and aquatic habitats by having the most miles of closed roads in riparian areas by decreasing the amount of open road miles to 73.7.	Alt. D would improve aquatic and riparian habitats more than Alt. A, but not as much as Alts. B and C by having 81.2 miles of open roads in riparian areas.
Lands and realty	Alt. A would not protect the genetically pure westslope cutthroat trout population in Muskrat Cr. with a 180 acre mineral withdrawal. Mining in and along Muskrat Cr. could cause a loss of riparian vegetation, streambed and bank destabilization, erosion and sedimentation and alteration of floodplain and stream morphology. Alt. A could allow crushing or disturbance of gravels during spawning and when eggs are incubating/hatching. If mining operations cause a decline in this population, the population may no longer be able to function as a donor source of fish for MT and may impede long-term restoration efforts.	Same as Alt. A.	Alt. C would provide long-term protection of riparian and aquatic habitats for the restored population of westslope cutthroat trout in Muskrat Creek from the negative effects of mining (including placer mining) on aquatic and riparian species through a 180 acre mineral withdrawal. Alt. C would ensure long-term protection to the newly restored westslope cutthroat trout population in Muskrat Creek from the direct detrimental effects of mining (including placer mining) by implementing a 180 acre mineral withdrawal.	Same as Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
F				
Special designations	Alt. A would protect the least amount of fish bearing stream (11.4 miles) through ACEC designations. No streams would be recommended for WSR but management would protect ORVs on all four eligible segments (12 miles).	More protective of fish-bearing streams with 30.6 miles in ACEC designations. More protection to fish and aquatic resources than Alts. A and D with two eligible segments (5.7 miles) recommended for WSRS.	Most protective of fish-bearing streams with 32.9 miles in ACEC designations. More protective than Alt. B because of additional miles in Elkhorns ACEC designation. Most protection to fish and aquatic resources from WSRS with four segments (12 miles) recommended as suitable.	More miles of fish-bearing streams in ACEC designations than Alt. A (21.5 miles), but less than Alts. B and C. No eligible WSRs would be recommended as suitable.
SP				
Wildlife				
Raptors	Under Alt A, there would be no restrictions on projects around active raptor nests. No unoccupied raptor nest sites would be protected from loss of habitat.	Alt. B could prevent more raptors from abandoning nests due to noise and project implementation than Alts. A and D with a 0.5 mile noise disturbance buffer. Enhanced protection and recruitment of raptors through protection of unoccupied nests for 5 years and retention of suitable habitat within 0.25 mile radius.	Alt. C would prevent more raptors from abandoning nests compared to all other alternatives with a 1 mile noise disturbance buffer. Substantial protection to raptors due to a 0.5 mile buffer around unoccupied nests and protection for 7 years.	Alt. D would have a smaller buffer around raptor nests (0.25 mile) and would have more detrimental effects to raptors than Alts. B and C but less than Alt. A. Less protection than Alts. B and C due to a 0.25 mile buffer around unoccupied nests and protection for 3 years.
Bald eagles	There is no identified management for restoration of bald eagle nest and roost sites.	Alt. B would treat vegetation around bald eagle nest and roost sites to protect nest trees from fire and promote development of nest trees.	Same as Alt. B.	Same as Alt. A.
Grizzly bear habitat	Road densities and open roads can impact the quality and quantity of grizzly bear habitat.	Closing roads under Alt. B would minimize the negative impacts on bears related to	Alt. C would provide the largest blocks of effective grizzly bear habitat of all alternatives	Although Alt. D would provide better quality habitat for grizzly bears than Alt. A, road densi-

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
	Grizzly bears underutilize habitat near roads and other human activities. MFWP recommends that land management agencies manage for an open road density of 1 mi/mi^2 or less in occupied grizzly bear habitat. Alt. A would have the lowest quality and the least amount of functional grizzly bear habitat compared to the other alternatives with a road density of 2.4 mi/mi^2 in occupied grizzly bear habitat.	disturbance and interactions with humans more than under Alts. A and D but less than under Alt. C. Alt. B would have a road density of 0.8 mi/mi^2 in occupied grizzly bear habitat. Alts. B and D would maintain functional habitat by restricting new, permanent roads in areas where open road densities are 1.0 mi/mi^2 or less.	by reducing road densities to 0.6 mi/mi^2 in occupied grizzly bear habitat and by restricting new, permanent roads in areas where open road densities are 1.5 mi/mi^2 or less.	ties would still be above the 1 mi/mi^2 (1.3 mi/mi^2) recommended by MFWP. Alt. D would provide lower quality and less functional habitat for grizzly bear than Alts. B and C.
Oil and Gas leasing	Alts. A and D would have CSU for grizzly bear and gray wolf and would not ensure protection from disturbance or loss of habitat from oil and gas exploration and development. Alts. A, B and D would have similar protections from NSO or TL to prairie dog towns, sage grouse winter and spring range and bald eagle nest sites. Sage grouse would be the least protected under Alt. A with TL of 0.25 mile radius of leks.	Grizzly bear in the recovery zone would be completely protected from disturbance and habitat loss with a NSO but bears in the distribution zone would only be protected from disturbance in the spring and fall. Gray wolf den sites would be protected from disturbance but not from loss of habitat. Alts B and D would give peregrine falcons more protection from disturbance and loss of habitat than with Alts. A. Sage grouse leks would be completely protected from disturbance during the breeding season under Alts. B and D but habitat could be lost.	Grizzly bear, gray wolf, sage grouse, bald eagle, peregrine falcon, and ferruginous hawk would all be protected from disturbance and loss of habitat with NSO or NL under Alt. C. Sage grouse leks would be completely protected from disturbance and habitat loss under Alts. C with a 3 mile NSO.	Alts. A and D would have CSU for grizzly bear and gray wolf and would not ensure protection from disturbance or loss of habitat from oil and gas exploration and development.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
SP				
Fish				
Westslope cutthroat trout	No emphasis on which westslope cutthroat trout populations should be restored. No management emphasis to remove non-native species that out-compete or breed with westslope cutthroat trout.	Alt. B could cause an expansion in population by emphasizing restoration of genetically pure and <20 percent hybridized westslope cutthroat trout and their habitats. Alts. B and C would prevent the loss or degradation of westslope cutthroat trout populations by removing non-native species that outcompete or breed with westslope cutthroat trout.	Alt. C would allow the greatest amount of population expansion by emphasizing restoration of all westslope cutthroat trout populations and their habitats, regardless of the degree of hybridization. Same as Alt. B.	Alt. D would allow the least amount of population expansion of the action alternatives by emphasizing restoration of genetically pure and <10 percent hybridized westslope cutthroat trout and their habitats. Same as Alt. A.
Oil and gas leasing	Alt. A would provide the least amount of protection to aquatic species with NSOs up to 0.25 mile for westslope and Yellowstone cutthroat trout and Arctic grayling, and a CSU for bull trout.	NSO within 0.5 mile of streams would protect westslope and Yellowstone cutthroat trout, Arctic grayling, and bull trout.	Greatest amount of protection of all alternatives to westslope and Yellowstone cutthroat trout, Arctic grayling, and bull trout with NSO or No Lease within 0.5 mile of streams.	Alt. D would provide more protection over Alt. A with 0.5 mile CSU or NSO but less protection than under Alts. B or C.
Plants				
Noxious Weeds	Under the worst case scenario analysis assumptions, Alt. A would have the fewest acres of noxious weed spread (43,000) of all alternatives, placing the least amount of habitat at risk.	Under a worst case scenario, Alt. B would have the second highest acres of spread (48,000) of all alternatives, putting more special status plant habitat at risk.	Under a worst case scenario, Alt. C would have the most acres of weed spread (51,000) of all alternatives, placing the most habitat at risk.	Under a worst case scenario, Alt. D would have fewer acres of weed spread (47,000) than Alts. B and C, putting less habitat at risk than the other action alternatives.
OHV	Most motorized use activity and miles of open road, placing the most habitat at risk.	Less motorized use activity than Alts. A and D, lesser impacts on special status plant habitat.	Least motorized use activity of all alternatives, posing the least impacts on habitat.	Less motorized use activity than Alt. A, but more than Alts. B and C. More potential habitat impacts than other action alternatives.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Riparian buffers	SMZs would limit disturbance to Idaho sedge and small yellow lady's slipper habitat.	RMZs would provide greater buffers than SMZs and also buffers for non-forested species such as mealy primrose, Ute ladies' tresses and dwarf purple monkeyflower.	Largest RMZ buffer for riparian species, protecting riparian and some upslope special status plants the most of all alternatives.	Same as Alt. A.
Dry forest tree, shrub, grass treatments	Less habitat treated than Alts. B and D. Potential short-term adverse effects due to ground disturbance would be less, as would potential long-term benefits of treatments than Alts. B and D.	Treatments to restore dry forest, shrub, and grass habitat higher than Alts. A and C. Greater potential short-term adverse effects due to ground disturbance, but greater long-term benefits than Alts. A and C.	Fewest acres of habitat treatments of all alternatives. Fewer potential short-term adverse effects along with fewer long-term benefits of all alternatives.	Most acres of habitat treatment of all alternatives. Most potential short-term adverse effects along with most long-term benefits of all alternatives.
Oil and Gas	NSO within 0.25 mile of known sensitive status plant populations would reduce risk of habitat disturbance.	NSO within 0.25 mile of known sensitive status plant populations would reduce risk of habitat disturbance.	Greatest reduction in risk of habitat disturbance with NSO within 0.5 mile of known special status plant population.	NSO of known sensitive status plant populations would limit disturbance of populations, however risk of habitat disturbance and fragmentation would be the highest.
WILDLAND F				
Fire management	Provides 7,300 acres of Category A fire management in which wildland fire is not desired which will limit fuels treatment options to mechanical treatment on those acres.	Contains no Category A fire management, providing some flexibility in fire management.	Most restrictive fire management alternative with most acres (41,000) of Category A fire management which will limit fuels treatment options to mechanical only treatment on those acres.	Allows greatest flexibility in fire management with no Category A fire management and highest Category D acres.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
WILDLAND F				
Fire suppression strategies	Allows for some flexibility to manage fires but a large percentage could be controlled while still small in size.	Same as Alt. A, but more flexibility to manage fires since no Category A designations.	Greatest potential to reduce loss of life and property and protect resources because fire suppression high priority.	Same as Alt. A.
Hazardous fuel treatments	Reduces fuels on second least acres (14,430 per decade). Lower fuel levels would result in a reduced potential for high-severity fires.	Reduces fuels on second most acres per decade of all alternatives, and would reduce fire intensity and behavior, improve fire fighter safety, and move towards historic FRCC levels more than Alts. A and C.	Reduces fuels on least acres of all alternatives, which would do the least to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC.	Reduces fuels on the most acres of all alternatives and would do the most to reduce fire intensity and behavior, improve wildland fire fighter safety, and move toward historic FRCC levels.
Travel management	Provides greatest access for fire suppression and fuel treatments and most opportunities for human caused wildland fire.	Provides second lowest level of access for fire suppression and fuel reduction treatments, and fewer opportunities for human-caused fire ignitions.	Provides the least access for fire suppression and fuel treatments and fewest opportunities for human-caused wildland fire.	Provides second highest level of access for fire suppression and fuel reduction treatments, and second highest opportunities for human-caused fire ignitions.
Recreation Opportunity Spectrum (ROS)	Determined on case by case basis. Provides for most flexibility between alternatives.	Could limit the flexibility for designing and planning fuels projects and implementing fire suppression on 36,800 acres.	Could limit the flexibility for designing and planning fuels projects and implementing fire suppression on 63,700 acres.	Could limit the flexibility for designing and planning fuels projects and implementing fire suppression on 30,000 acres.
Visual Resource Management	Second fewest acres designated in VRM Class I and II. This would provide for more flexibility for designing, planning, and implementation of fuels projects.	80,400 acres designated in VRM Class I and II. This could limit the effectiveness and flexibility for designing, planning, and implementation fuels projects on those acres.	The most VRM Class I and II lands (99,100 acres) of any alternative, which may affect the extent of some fire management actions and fuel treatments more than under any other alternative.	The least VRM Class I and II lands (38,100 acres) of any alternative, which may affect the extent of some fire management actions and fuel treatments.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Wildlife (Seasonal Timing Restrictions)	There would be no seasonal timing restrictions for prescribed fire or mechanical treatments in this alternative	Restrictions for prescribed fire in this alternative. This may cause delays, higher cost, and possible less effectiveness in reducing fire intensity and behavior, improve wildland fire fighter safety, and change FRCC.	Restriction on prescribed fire and mechanical treatments. This may limit the opportunities and effectiveness of to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC especially in areas of wildland urban interface.	Same as Alt. A.
CULTURAL A				
Recreation sites/ special designations	Possible adverse effects due to development of recreation sites.	Increased protection of tradition-al cultural properties over Alts. A and D due to acreage managed as ACECs and increased restrictions on surface disturbing activity.	Most protective of cultural properties due to largest acreage managed as ACECs.	Increased protection of traditional cultural properties over Alt. A due to increase in acreage managed as ACECs.
Oil and gas leasing	Large number of cultural sites would be vulnerable to adverse effects due to standard lease terms and controlled surface use stipulations.	Fewer cultural sites would be vulnerable to adverse effects due to standard lease terms and controlled use stipulations as well as NSO for traditional cultural properties compared to Alt. A.	Most protective of cultural sites because it has the lowest number of acres open for fluid mineral leasing.	Same as Alt. B.
Forest treatments	Risk of impacting cultural and paleontological resources due to ground disturbance from vegetation treatments would not change.	Alt. B would place more cultural and paleontological resources at risk due to an increase in forest treatments over Alt. A.	Fewer cultural and paleontological resources would be at risk than in the other alternatives due to less ground disturbance from vegetation treatments.	Highest proposed forest treatment acres would put more cultural and paleontological resources at risk than under any other alternative.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
CULTURAL A				
Visual Resource Management	Lowering the number of acres managed as Class II in this alternative may have an adverse impact on traditional cultural properties, which often incorporate the quality of the viewshed for traditional values.	Increasing Class II acreages would improve the visual quality of traditional cultural properties in those viewsheds.	Most beneficial to traditional cultural properties by providing greatest acres managed under Class II and III and allowing fewest viewshed intrusions.	Same as Alt. B.
Soil protection	Alt. A would put the most cultural and paleontological resources at risk of loss from erosion due to less protection of the soil resource.	Alt. B would prevent soil erosion more than Alts. A or D and would therefore protect more cultural and paleontological resources.	Alt. C would be most protective of soil resources and would therefore, protect more cultural and paleontological resources.	Same as Alt. A.
OHV and Travel Management	This alternative has the most miles of open roads and the fewest miles of closed roads. Therefore, this alternative presents the highest risk of vandalism and erosional damage to cultural resources and paleontological localities.	Since this alternative has more closed roads, fewer cultural resources are at risk than under Alts A and D. Some resources may be at risk from road closures and decommissioning requiring mechanical treatment.	Alt C. would protect the most cultural resources and paleontological localities from vandalism because of the large number of closed roads, but it would also present some risk to other resources when closed and decommissioned roads require physical treatment prior to closing.	Alt. D would put more sites at risk than Alts. B and C due to the provision for more open roads. Alt. D would have less risk than Alt. A.
VISUAL RESOUR				
Vegetation treatments	Second lowest potential for short-term adverse impacts to visual qualities due to vegetation treatments in grasslands and shrublands (5,250 acres/ decade). Second lowest potential for long-term benefits due to enhanced vegetation conditions and reduced wildfire risks.	Increased treatment of grassland and shrubland habitat (second highest – up to 15,450 acres/ decade) could create additional short to mid-term impacts to visual quality due to changes in color and texture but would promote long-term visual benefits due to reduced potential for large-scale wildland fires.	Least grassland and shrubland treatments of the action alternatives. Effects would be similar to Alt. B but to a lesser extent, given that only up to 2,750 acres of treatment would be targeted/ decade.	Greatest potential impacts/ benefits to visual resources, since this alternative proposes the most vegetative treatments (up to 25,850 acres/ decade).

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Forest products removal	Second lowest potential impacts to visual resources from harvesting activities in dry forests (5,100 acres/decade) and cool, moist forests (2,400 acres/decade). Highest potential impacts from timber salvage given least restrictions imposed.	Second highest potential impacts from dry (up to 14,750 acres/ decade) and moist (up to 3,750 acres/decade) forest harvests. Second highest potential for impacts from salvage related activities.	Lowest potential impacts of all alternatives given that potential forest treatment acres within forest types (dry-up to 4,800 acres/decade and moist- up to 550 acres/decade) would be the lowest and restrictions governing salvage cutting are the most restrictive.	Highest potential impacts from dry (up to 18,200 acres/decade) and cool, moist (5,050 acres/decade) forest harvests. Second lowest potential for impacts to visuals next to Alt. A, from salvage harvests.
Travel management	Due to highest number of open motorized roads (629 miles), effects on visual quality would be highest of all alternatives.	Scenic qualities would be enhanced and sensitive viewpoints reduced by reducing designated routes more than Alts. A and D, to 417 miles.	Lowest impacts to visual resources of all alternatives given that motorized uses and open roads would be limited to 372 miles.	Second highest impacts to visual resources as open roads would total about 479 miles.
ROS	Does not establish ROS and would therefore be least protective of visual resources of all alternatives.	More protection for visual resources than Alts. A and D due to designation of one third of BFO lands (108,600 acres) as semi-primitive non-motorized and semi-primitive motorized.	Greatest protection for visual resources of all alternatives since highest acreages managed as semi-primitive non-motorized and motorized (130,600 acres).	Second fewest acres designated under the more protective ROS settings (67,600 acres) and therefore visual resources would be subject to more potential impacts than under Alts. B and C.
Mineral and energy exploration	Potential impacts from oil and gas leasing would be higher than under Alt. D because of CSU stipulation that would only be Standard Lease Terms under Alt. D. Short and mid-term impacts from salable minerals would continue until vegetation and excavation are reclaimed.	Potential impacts from oil and gas leasing would be similar as Alt. A because of same CSU stipulation. Reduced impacts compared to Alt. A due to proposed withdrawal of 198 acres from mineral entry.	Least impacting alternative to visual resources since oil and gas leasing would be excluded from 89 percent of DA. Benefits from proposed mineral withdrawals would be the same as under Alt. B.	Impacts from oil and gas leasing would be the greatest compared to all other alternatives due to SLTs instead of CSU stipulation. Effects of other mineral activity similar to Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
VISUAL RESOUR				
Special designations	More protective of visual resources than Alt. D since six WSAs managed as VRM Class I and four suitable WSR segments as VRM Class II.	More special designation acres classified as VRM Class II than Alt. A due to four ACEC designations and two suitable WSR segments.	Most visual protection of all alternatives since all four eligible WSR segments found suitable and afforded greater long-term protection, and because more areas and acres would be designated as ACECs than under any other alternative.	Greatest potential visual impacts of all alternatives because no WSR segments would be protected and fewer acres would be designated as ACECs.
FORESTRY				
PSQ	Alt A would provide amounts of forest products up to current levels under existing planning.	Alt B. would provide similar amounts of forest products as provided under Alt. A, utilizing treatment approaches that treat group of stands or forested areas taken together holistically rather than an individual stand by stand perspective that strives to provide the most products over time.	Alt. C would provide the least forest products of all alternatives	Alt. D would provide more forest products than all alternatives, by more aggressively treating more acres with fewer intermediate treatments.
Recreation Opportunity Spectrum	No ROS Classifications and no overall adjustment in forest product offerings.	Approximately 18,554 acres of forest and woodlands designated ROS Semi-primitive non-motorized and 26,283 acres designated as Semi-primitive motorized, potentially reducing PSQ on 41 percent of forested areas available for product removal. Seventeen percent potential reduction in the forested area available for small public demand sales such as Christmas trees and firewood	Most restrictive of all alternatives. Approximately 23,895 acres of forest and woodlands designated ROS Semi-primitive non-motorized and 31,583 acres designated as Semi-primitive motorized, potentially reducing PSQ on 50 percent of forested areas available for product removal. Twenty nine percent potential reduction in the forested area available for small public demand sales such	Approximately 18,029 acres of forest and woodlands designated ROS Semi-primitive non-motorized and 13,823 acres designated as Semi-primitive motorized, potentially reducing PSQ on 29 percent of forested areas available for product removal. Sixteen percent potential reduction in the forested area available for small public demand sales such as Christmas trees and firewood from

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
		from area available under Alternative A.	as Christmas trees and firewood from area available under Alternative A.	area available under Alternative A.
Visual Resource Management	No VRM Classifications and no overall adjustment in forest product offerings, but adjustments could occur on a case by case basis depending on analysis of impacts.	Approximately 16,902 acres of forest and woodlands designated VRM Class II potentially reducing PSQ on 15 percent of forested areas available for product removal under Alternative A.	Most restrictive of all alternatives. Approximately 27,259 acres of forest and woodlands designated VRM Class II potentially reducing PSQ on 25 percent of forested areas available for product removal under Alternative A.	Same as Alt. A.
Riparian management	Highest forest product offerings and support of PSQ in riparian and nearby upland areas, as restrictions would be limited only by state regulations derived from Montana SMZ laws.	Limited product offerings as riparian management objectives would dictate treatment type and level of forest change needed to meet objectives in the RMZs, which are defined as 160 feet on either side of fish bearing streams (39 acres per mile of stream), 80 feet on either side of non-fish bearing streams (19 acres per mile of stream), and 50 feet on either side of intermittent streams (12 acres per mile of stream). Forest management and product removal efficiency would be reduced as access and heavy equipment use would be restricted in these areas, based on impacts to resources in the RMZ.	Alternative C provides the smallest amount of product offerings and support of PSQ from RMZs, which are defined as 300 feet on either side of fish bearing streams (73 acres per mile of stream), 150 feet on either side of non-fish bearing streams (36 acres per mile of stream), and 50 feet on either side of intermittent streams (12 acres per mile of stream). No commercial forest products would be removed from these areas.	Same as Alt. A

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
FORESTRY				
Small forest product sales	Alts. A and B are similarly effective at meeting public demand for small sale products, with Alt. B having slightly higher amounts of products made available due to a more proactive landscape approach and anticipated use of stewardship tools. Permits for forest products are less than estimated under Alts. B and D and much more than Alt. C.	Second most effective at meeting public demand for small sale products. Alt. B is less restrictive with more permits than Alts. A and C, but less than Alt. D.	Least effective at meeting public demand for small sale products. Lowest number of permits for forest products removal of all alternatives. Firewood would be least available to the public under this alternative, using permits to cut green trees or dead and down wood in designated areas.	Highest level of permits for forest products. Most effective at meeting public demand for small sale products.
Biomass	Opportunities for biomass would be 55 CCF/decade, the least of all alternatives.	Biomass production would be approximately 77 CCF/decade.	Same as Alternative A.	Biomass production would be greater than under all other alternatives with 105 CCF/decade.
Timber salvage	Alt. A provides greatest salvage opportunities. Loss of forest products from fire would create greater salvage opportunities than under all other alternatives.	Limited salvage compared to Alt. A. Salvage from fire mortality would have less product removal than Alternatives A and D.	Limited salvage opportunities compared to other alternatives as Alternative C includes most restrictive prescriptions. Projects are likely to be smaller and occur less often.	Alt. D limits salvage compared to Alt. A, but projects would be larger and occur more often than Alternatives B and C.
Travel management	Provides greatest access for small sales permits and economic efficiency for forest management and timber removal activities, with approximately 416 open road miles available in the five site-specific travel planning areas. Most miles of open and seasonally limited roads, approx-	Road closures could reduce economic efficiency of some projects, reduce public access for small sales permits. Approximately 84 percent of the roads available under Alt. A for timber removal in the five site-specific travel planning areas would be available under Alt. B , 45 percent of which would be	Reduces economic efficiency of projects compared to Alternative B, as no construction of new permanent roads would be allowed. Public access for small sales would be reduced more than under other alternatives due to fewer open roads. Approximately 87 percent of the roads available for timber	Economic efficiency similar to Alternative B, but public access for small sales permits and ability to meet public demand would be greater than Alts. B and C. Approximately 87 percent of the roads available for timber removal in the five site-specific TPAs under Alternative A would still be available,

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
	imately 379 miles would support small product sales.	available for public use in the removal small sale products such as Christmas trees and firewood.	removal under Alt. A in the five site-specific travel planning areas would still be available under Alt. C, 33 percent of which would be available for public use in the removal small sale products such as Christmas trees and firewood.	61 percent of which would be available for public use in the removal small sale products such as Christmas trees and firewood.
LIVE				
	Alts. A and D provide greatest opportunity for livestock grazing with 278,000 acres available.	270,000 acres available for grazing would be more than Alt. C, but less than Alts. A and D.	Fewest acres (262,000) available for livestock grazing.	Same as Alt. A.
Vegetation treatments	Forage quality and quantity improvement on grasslands and shrublands would slowly decline because of net increase in conifer encroachment (1,161 acres per decade). Short-term effects would occur where deferment and temporary removal of livestock required after vegetation treatments.	Forage quality and quantity improvement on grasslands and shrublands would improve because of net decrease in conifer encroachment (up to 9,039 acres per decade). Short-term impacts to grazing from the one-year resting period before vegetation treatment and the two-year resting period after treatment (with case by case flexibility).	Forage quality and quantity improvement on grasslands and shrublands would decline at fastest rate because of net increase in conifer encroachment (3,661 acres per decade). Impacts to livestock grazing are mandatory rest one year prior to treatment and rest two growing seasons following treatments.	Greatest improvement in long-term livestock forage quality and quantity due to most acres undergoing vegetation treatment resulting in largest net decrease of conifer encroachment— up to 19,489 acres per decade. Short-term impacts to grazing from the one-year resting period before vegetation treatment and the one-year resting period after treatment.
Noxious weed management	Under a worst case scenario of weed treatment accomplishments in under action alternatives, Alt. A would have the least amount of noxious weed spread—to 43,000 acres over a ten year period and would have the least impact to livestock forage base.	Forage base for livestock grazing reduced under worst case weed treatment scenario because noxious weed spread would reach up to 48,000 acres in ten years.	Worst case weed treatment scenario could lead to noxious weed spread on up to 51,000 acres over ten years would reduce the forage base the most of all alternatives.	Worst case weed treatment scenario could lead to noxious weed spread on up to 47,000 acres over ten years, consequently more livestock forage would be maintained than under alternatives B and C, but less than A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
LIVE				
Travel management	Greatest potential conflicts (gates left open, livestock disturbance, etc.) with grazing program due to the most roads open and open w/restrictions – 629 miles DA-wide.	Compared to Alt. A, conflicts between grazing and wheeled vehicles would be reduced due to road closures leaving 417 miles of roads open and open w/restrictions DA-wide.	Alt. C would provide the least miles of road open and open w/restrictions – 372 miles DA-wide, resulting in fewest conflicts with grazing of all alternatives.	Conflicts with grazing more than Alts. B and C, but less than Alt. A, as 479 miles of road would be open and open w/restrictions DA-wide.
ENERGY				
Riparian management zones	No change.	Potential additional expenditures and longer permitting timeframe for the mineral developer due to requirements to avoid roads and facilities inside RMZs when possible. Placer mines could be more difficult and time consuming to permit.	Additional restrictions could impact the ability to proceed with the project, should access to water or the stream bed be a critical part of the proposed operation. Operating/rehabilitation requirements could make some placer mining operations uneconomic.	Avoidance, mitigations, and BMPs associated with roads in riparian areas would make effects of Alt. D similar to Alts. A and B.
Leasable Minerals (Oil and Gas)				
Stipulations	Major constraints such as NSO stipulations may decrease some lease values, increase operating costs, and to a lesser extent require relocation of well sites and modification of field development. Leases issued with moderate constraints such as CSU or timing stipulations may result in similar impacts to a lesser degree and delays in operations and uncertainty. Under Alt. A, federal mineral estate lands would be available subject to the following levels	The impact of individual constraints would be similar to that for Alt. A; however, the level and nature and number of constraints varies from that alternative for this alternative. Under Alt. B federal mineral estate lands would be available, subject to the following levels of constraints: Major Constraints – 42.9% Moderate Constraints – 49.9% Standard Terms – 2.8% Approximately 4.4% would be unavailable for lease.	The impact of individual constraints would be similar to that for Alternative A; however, the level, and nature and number of constraints varies from that alternative for this alternative. Under Alt. C federal mineral estate lands would be available, subject to the following levels of constraints: Major Constraints – 3.7% Moderate Constraints – 4.7% Standard Terms – 2.6% Approximately 89.0% would be unavailable for lease.	The impact of individual constraints would be similar to that for Alternative A; however, the level, and nature and number of constraints varies from that alternative for this alternative. Under Alt. D federal mineral estate lands would be available subject to the following levels of constraints: Major Constraints – 14.3% Moderate Constraints – 71.8% Standard Terms – 8.3% Approximately 5.6% would be unavailable for lease.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
	of constraints: Major Constraints – 38.6% Moderate Constraints – 48.1% Standard Terms – 4.9% Approximately 8.4% would be unavailable for lease. Alts. A and B would be similar in their level of constraints.	Alternatives A and B would be similar in their level of constraints.	Alternative C would be the most restrictive of the four alternatives.	Alternative D would be the least restrictive of all alternatives.
Locatable Minerals				
High mineral potential – 118,560 total acres	103,541 open acres 11,344 restricted acres 3,675 closed acres	77,390 open acres 37,495 restricted acres 3,675 closed acres	71,359 open acres 43,455 restricted acres 3,746 closed acres	103,541 open acres 11,342 restricted acres 3,675 closed acres
Medium mineral potential – 34,952 total acres	24,505 open acres 6,495 restricted acres 3,952 closed acres	21,414 open acres 9,586 restricted acres 3,952 closed acres	17,473 open acres 13,527 restricted acres 3,952 closed acres	24,505 open acres 6,495 restricted acres 3,952 closed acres
Low to None Mineral Potential – 151,466 total acres	111,092 open acres 30,479 restricted acres 9,894 closed acres	99,899 open acres 41,647 restricted acres 9,919 closed acres	87,196 open acres 54,248 restricted acres 10,022 closed acres	111,804 open acres 29,758 open acres 9,894 closed acres
Totals	239,138 open acres 48,319 restricted acres 17,522 closed acres	198,704 open acres 88,728 restricted acres 17,547 closed acres	176,028 open acres 111,230 restricted acres 17,720 closed acres	239,850 open acres 47,607 restricted acres 17,522 closed acres
Notes: Acreage analyzed excludes approximately 2,300 acres not covered by the MBMG Mineral Potential reviews and 347,000 acres of federal subsurface minerals. Restricted areas include WSAs, ACECs, Wild and Scenic Rivers, and Threatened and Endangered species habitat (grizzly bear and bull trout) Closed areas include Withdrawals and lands acquired with LWCF funds. Open areas are all other areas Travel Plan road designations not included in analysis				
Lands and realty	Increased or decreased opportunities to explore/develop areas could result from acquisition or disposal of lands with mineral value.	Same as Alt. A. Additionally, proposed withdrawal of 198 acres in recreation sites would decrease available acres in the BFO for mineral location.	Proposed withdrawal of 378 acres in recreation sites and Muskrat Creek drainage would decrease available acres in the BFO for mineral location.	Same as Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
ENERGY				
Special designations	Performance standards required for protection of relevant and important values of ACECs, and Notice-level review that would require NEPA analysis would cause time delays for permitting.	Same as Alt. A.	Same as Alt. A.	Same as Alt. A.
Travel management	Alternative A is less restrictive in providing access to mineralized areas than any other alternative.	Alternative B is potentially more restrictive on access to mineralized areas than Alternatives A and D, and less restrictive than Alternative C. Operators would need to obtain travel variances to conduct exploration on more closed roads than under Alternatives A and D.	Alternative C is potentially the most restrictive alternative for access to mineralized areas. Operators would need more travel variances to conduct exploration on closed roads than under any alternative.	Alternative D is the least potentially restrictive of the action alternatives, but more restrictive than Alternative A for access to mineralized areas.
Abandoned mine lands	Reclamation of AML would reduce risks to the public from potential environmental or safety hazards. However these activities will also result in the removal or obscuring of information used by exploration companies to sample and map mineral deposits.	Same as Alt. A.	Same as Alt. A.	Same as Alt. A.
Salable Minerals				
	Mine development for salable minerals would usually be located near municipalities or small rural communities to maximize convenience to the public.	Additional expenditures and longer approval time could result from management direction to avoid or minimize effects on riparian zones from structures, support facilities, and roads.	Same effects as Alt. A, but since development of new pits by private citizens would be eliminated; mineral materials would cost more through commercial sources due to higher transportation costs.	Same as Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
RECREATI				
Vegetative treatments	Second lowest potential for quality recreation experiences dependant on natural settings due to disturbances associated with vegetation treatments.	Second highest potential for impacts on dispersed recreation uses due to higher disturbances associated with vegetation treatments.	Lowest potential for impacts on dispersed recreation uses due to disturbances associated with vegetation treatments since least acres treated.	Highest potential for impacts on dispersed recreation uses from disturbances associated with vegetation treatments since most acres treated.
Riparian restoration	Dispersed recreation most impacted and developed site management least impacted since riparian protection less restrictive than Alts. B and C.	Dispersed recreation in riparian areas improved and developed site management impacted over Alts. A and C due to increased size of RMZs.	Most enhanced dispersed recreation experiences and impacts to developed site management due to greater RMZ protective measures.	Same as Alt. A.
Noxious weeds	Recreationists seeking a natural setting with fewer weeds would benefit most since this alternative would result in the lowest projected weed infestation (43,000 acres by 2015 under worst case weed treatment scenario).	More beneficial to recreationists desiring natural setting experiences without weeds (48,000 acres of weed infestation by 2015 under worst case weed treatment scenario) than Alt. C, but less than Alts. A and D.	Recreationists seeking a natural setting without weeds would benefit least under this alternative given the projected weed infestation of 51,000 acres by 2015 under the worst case weed treatment scenario.	More beneficial to recreationists desiring natural setting experiences without weeds (47,000 acres by 2015 under worst case weed treatment scenario) than Alts. B and C, but less beneficial than Alt. A.
Road densities	Least impact to motorized users and potentially the greatest impact to non-motorized users since Alt. A features the most open roads.	More impacts to motorized users than Alts. A and D due to projected reduction of open roads in big game winter range. Recreationists seeking non-motorized experiences would be benefited the second most next to Alternative C.	Motorized users most impacted and non-motorized users most benefited due to an added restriction of no net increase in permanent roads where target road densities are exceeded in big game winter range areas.	Impacts to motorized riders less than Alts B and D due to higher road densities and more open roads.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
ENERGY				
User opportunities	Most opportunities for motorized users, those seeking organized motorized events, and snowmobile riders due to fewest restrictions. Fewest non-motorized opportunities. Most opportunities for boat-in camping.	More opportunities than Alts. A and D for non-motorized users due to fewer open roads. Fewer opportunities for motorized use, organized motorized events and snowmobile riding. Reduction in dispersed recreation sites by limiting boat-in camping opportunities.	Greatest opportunities for non-motorized users due to fewest open roads. Least motorized and snowmobile opportunities. Opportunities for organized motorized events eliminated. Dispersed camping at Holter and Hauser Lakes eliminated by closing entire shoreline to boat-in camping except at developed sites.	Provides most opportunities for motorized users, next to Alt. A due to acres available for motorized events, mileage of open roads and fewest opportunities for non-motorized users. Boat-in camping opportunities same as Alt. A.
SRMAs	Recreation management emphasis prioritized within SRMAs ensuring quality recreation opportunities and experiences are provided.	Increased recreation management over Alts. A and D through addition of four more SRMA designations.	Same as Alt. B but most SRMAs within ROS Semi-Primitive, Non-Motorized setting.	Same as Alt. A.
Outfitter fees, permits and camping limits	Value based revenues from outfitters using developed BLM river/lake access sites not realized. Greatest opportunities offered for commercial and public camping.	Fair value revenues realized from outfitters using developed BLM river/lake access sites. Commercial and public camping opportunities limited to a greater degree than Alts. A and D.	Fair value revenues maximized from outfitters using developed BLM river/lake access sites. Commercial and public camping opportunities limited the most.	Fair value revenues from outfitters using developed BLM river/lake access sites realized in a more comprehensive and customer friendly manner. Commercial and public camping opportunities same as Alt. A.
User conflicts and violations	Potential for social conflicts and violations within the Scratchgravel Hills would be the highest since no management changes would occur.	Potential for social conflicts and violations within the Scratchgravel Hills would be reduced the second most given the proposed yearlong restrictions on motorized uses.	Potential for social conflicts and violations within the Scratchgravel Hills would be reduced the most given the additional restrictions proposed on motorized uses.	Potential for social conflicts and violations within the Scratchgravel Hills would be similar to Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Recreation Opportunity Spectrum	Possible negative impacts to recreation use since no ROS classifications. Management would be reactive rather than proactive.	Balanced approach for managing recreation settings, opportunities, and experiences compared to Alts. C and D.	Maximum acreage designated as ROS Semi-Primitive Non-Motorized creating greatest non-motorized and least motorized opportunities.	Highest acreage of designated ROS settings that allow for motorized uses, developed infrastructure and less natural settings. Impacts similar to Alt. A.
Special designations	Least protective of special designation values as only the Sleeping Giant ACEC (11,679 acres) would continue to be designated. None of the four eligible WSR segments would be recommended as suitable although ORVs would be protected.	Second greatest protection of the relevant and important values and associated recreation opportunities as four ACECs would be designated totaling about 70,644 acres and outstandingly remarkable values as two WSR segments totaling 5.7 miles would be protected and two segments totaling 6.3 miles dropped.	Most protective of special designation values and associated recreation opportunities as five ACECs would be designated totaling about 87,893 acres and all four WSR segments totaling 12 miles would be recommended as suitable.	Second least protective of special designation values and associated recreation opportunities as three ACECs would be designated totaling about 23,695 acres and no WSR segments would be protected.
Visual Resource Management	Protects second lowest acreage managed as Class I and II VRM	Second highest acreage under Classes I and II allowing management for higher natural character retention.	Highest acreage under Classes I and II allowing greatest level of management for natural character retention.	Least protective of recreational opportunities and experiences dependent on natural settings since lowest acreage managed as VRM Classes I and II.
Mineral and energy management	High probability that recreation settings and visitor experiences would be impacted by oil and gas leasing since second lowest level of stipulations.	Better protection of recreation facility investments and site opportunities than Alts. A and D since eight sites withdrawn from mineral entry. Lower probability of impacts to recreation settings and visitor experience than Alts. A and D due to stipulations on solid and fluid mineral activities.	Impacts from withdrawal of eight sites same as Alt. B. Lowest probability for impacting recreation settings and visitor experience due to most restrictive stipulations on solid and fluid mineral activities.	Highest probability for impacting recreation settings and visitor experiences due to lowest amount of restrictive stipulations on solid and fluid mineral activities.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRAVEL MANAGEME				
Travel Management – Field Office-wide				
Field Office-wide area designations for travel	Alt. A area designations for wheeled vehicles would be: Open- 4,367 acres Closed-31,500 acres Limited-271,442 acres.	Alt. B area designations for wheeled vehicles would be: Open- 283 acres Closed-31,500 acres Limited-275,526 acres.	Alt. C area designations for wheeled vehicles would be: Same as Alt. B.	Alt. D area designations for wheeled vehicles would be: Same as Alt. B.
Field Office-wide area designations for travel	Alt. A area designations for snowmobiles would be: Open- 143,206 acres Closed- 27,065 acres Limited- 137,038 acres.	Alt. B area designations for snowmobiles would be: Open- 112,682 acres Closed- 54,706 acres Limited- 139,921 acres.	Alt. C area designations for snowmobiles would be: Open- 26,148 acres Closed- 65,270 acres Limited- 215,891 acres.	Alt. D area designations for snowmobiles would be: Open- 139,138 acres Closed- 31,282 acres Limited- 136,889 acres.
Total miles of travel routes available	Under Alt. A, the total mileage of travel routes available Decision Area-wide (Open, Open/Restricted, Snowmobile Only, Non-Motorized Trails, Game Retrieval Only, Motorcycles Only, ATV Only) would be approximately 684 miles.	Under Alt. B, the total mileage of travel routes available (Open, Open/Restricted, Snowmobile Only, Non-Motorized Trails, Game Retrieval Only, Motorcycles Only, ATV Only) would be approximately 485 miles.	Under Alt. C, the total mileage of travel routes available (Open, Open/Restricted, Snowmobile Only, Non-Motorized Trails, Game Retrieval Only, Motorcycles Only, ATV Only) would be approximately 430 miles.	Under Alt. D, the total mileage of travel routes available (Open, Open/Restricted, Snowmobile Only, Non-Motorized Trails, Game Retrieval Only, Motorcycles Only, ATV Only) would be approximately 547 miles.
Motorized/non-motorized opportunities	Greatest number of motorized opportunities.	Substantially increased opportunities for non-motorized users. Motorized wheeled access restricted to routes leading up to non-motorized trailheads.	Route closures would result in net decrease of motorized routes and highest level of non-motorized opportunities compared to Alts. B and D. Same as Alt. B for competitive motorized events.	Alt. D is less restrictive and could result in more routes in the transportation system. Non-motorized opportunities would be more than under Alt. A, but less than under Alts. B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRAVEL MAN				
User conflicts	User conflict greatest under Alt. A, because motorized and non-motorized users would share same routes. Conflicts with snowmobile use would increase because cross-country travel would continue.	Reduced user conflict due to dispersed recreational opportunities.	Same as Alt. B.	Same as Alt. B.
Illegal activities	Greatest under Alt. A due to more miles open to yearlong motorized access.	Illegal activities may be less under Alt. B than Alts. A and D, but may still occur more than Alt. C.	Due to increase in route closures, Alt. C would have the least amount of illegal activity.	Illegal activities may be less under Alt. D than Alts. A, but may still occur more than Alts. B and C.
Road and trail safety	More accidents/injuries expected under Alt. A due to motorized and non-motorized users on the same routes.	Less accidents/injures due to dispersed recreational opportunities.	Same as Alt. B.	Same as Alt. B.
Forest management	If needed, up to 5.5 miles of new permanent roads could be constructed per year to provide access for treatments. Opportunities for motorized users could be increased and non-motorized users could be diminished by increasing road density for forest product management where permanent roads are constructed.	Temporary road construction would also be kept to a minimum, and temporary roads would be decommissioned within one year of project completion. Degree of new road construction would be less than Alts. A and D.	Temporary road construction would also be kept to a minimum, and temporary roads would be decommissioned within one year of project completion. Impacts less than other alternatives because no new permanent roads would be constructed.	Degree of road building would be less than Alt. A but more than Alt. B.
Wildlife and special status species	Reduced short term impacts on travel and access due to fewer seasonal wildlife closures than other alternatives.	Seasonal wildlife closures would create short term impacts on travel and access.	Same as Alt. B except stricter resource protection.	More seasonal wildlife closures than under Alternative A, but less restrictive than alternatives B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRAVEL MAN				
Road density	Road density would not change	Road density levels in big game winter ranges would result in fewer motorized routes and concentrated use on fewer roads.	Greater effect on transportation system than Alts. B and D due to proposed route closures.	Overall net decrease of available motorized routes but to a lesser extent than Alts B and C.
User compliance/ implementation	Information kiosks would enhance user compliance and public safety. Management costs under Alt. A would be mixed. Less personnel time would be required to monitor user compliance; however more effort would be required for initial signing efforts.	Moderate increase in travel management costs due to initial sign implementation and long-term travel plan compliance. In comparison, higher than Alts. A and D, but less than Alt. C.	Management costs would be greater than under all other alternatives due to greater efforts needed to monitor travel plan compliance.	Same as Alt. B.
Public easements	Acquiring easements would increase the overall route network and expand both motorized and non-motorized opportunities.	Same as Alt. A.	Same as Alt. A.	Same as Alt. A.
Special designations	Lowest potential impacts on future transportation routes given that only 11,679 acres would be recommended or designated as ACECs or WSRs.	Second highest acres protected as ACECs and WSRs and therefore transportation routes would be subject to greater restrictions.	Highest special designation acreage protected and therefore the most restrictions imposed on existing and future transportation systems.	Second lowest acreage protected as special designations therefore greater potential for future transportation access routes.
Mineral operations	New permanent roads for mineral development could increase public access.	Short or long-term increase in transportation system from permitting roads for mineral operations outside RMZs.	New roads would not be allowed within RMZs for mineral development. Some travel network expansion may occur with routes outside RMZs.	Same as Alt. B.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Helena TPA				
Motorized/Non-motorized opportunities	BLM would continue to allow recreational activities including motorized vehicle uses within the Scratchgravel Hills 24 hours/day.	The entire Scratchgravel Hills area would be closed to wheeled motorized vehicle uses yearlong with the exception of routes needed for residential access.	The entire Scratchgravel Hills area would be closed to both motorized and non-motorized recreational uses after dark (dusk to dawn) yearlong.	Same as Alternative A.
	No non-motorized trails designated. Motorized use would continue 24 hours a day within the Scratchgravel Hills.	Increased opportunities for non-motorized users since motorized access restricted to routes leading to existing trailheads in Scratchgravel Hills.	Alt. C would provide 15 percent more non-motorized routes than Alt. B and 85 percent fewer motorized routes than Alt. A.	Increased opportunities for motorized users because new loop routes created in Scratchgravel Hills.
	Area availability for wheeled, motorized use (in acres) - Open: 0, Closed: 0, Limited: 10,164	Area availability for wheeled, motorized use (in acres) same as Alternative A.	Area availability for wheeled, motorized use (in acres) same as Alternative A.	Area availability for wheeled, motorized use (in acres) same as Alternative A
	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 52.2	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 9.8	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 7.0	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 21.9
	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 0	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 42.5	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 45.3	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 30.8
Snowmobile use	Area wide cross-country snowmobile use would continue to be allowed as well as travel on all existing routes, during the season of use (12/2-5/15), snow conditions permitting.	Same opportunities as Alt. A.	Potential long-term effects to users because cross-country snowmobile use would not be allowed.	Same as Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRAVEL MANAGEME				
	Area availability for snowmobile use (in acres) - Open: 10,164, Closed: 0, Limited: 0 Miles of motorized routes available to snowmobile travel: 52.2		Area Availability for snowmobile use (in acres) - Open: 0, Closed: 0, Limited: 10,164 Miles of motorized routes available to snowmobile travel: 7	
User conflicts	User conflict would be greatest around the Scratchgravel Hills due to lack of opportunities to separate motorized from non-motorized uses.	Minimal conflicts. With the exception of a few routes needed for residential access, the Scratchgravel Hills are closed to motorized recreation use.	Alt. C would be most beneficial to reducing user conflict than other alternatives.	Same as Alt. B.
Illegal activities	Greatest level of illegal activities expected to occur.	Illegal activities (underage drinking, vandalism, dumping) in the Scratchgravel Hills would be substantially reduced. With the exception of a few routes needed for residential access, public access would be restricted to non-motorized trailheads.	Lowest level of illegal activity expected since use of Scratchgravel Hills would be restricted after dark.	Illegal activities would be less than Alt. A but more than Alts. B and C.
Road and trail safety	More accidents/injuries expected under Alt. A due to motorized and non-motorized users on same routes.	Less accidents/injures due to dispersed recreational opportunities.	Greater benefit than Alt. B because use of Scratchgravel Hills would also be restricted after dark.	Same as Alt. B.
User compliance	No additional effort needed.	Substantial effort required to educate public on change in use for Scratchgravel Hills.	Same as Alt. B. Increased cost could result from need to expand trailhead parking lots.	Same as Alt. B.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
East Helena TPA				
Motorized/ Non-motorized opportunities	Alt. A would have 60 percent more motorized opportunities than Alts. B and C, and 15 percent more than Alt. D.	Non-motorized opportunities would increase in North Hills compared to Alts. A and D. Alt. B would also provide increased opportunities for disabled hunters.	Least amount of motorized access of all alternatives providing most non-motorized opportunities.	Alt. D would have 14 percent fewer motorized opportunities than Alt A and over 55 percent more than Alts. B or C.
	Area availability for wheeled, motorized use (in acres) – Open: 0, Closed: 0, Limited: 20,266	Area availability for wheeled, motorized use same as Alternative A.	Area availability for wheeled, motorized use same as Alternative A.	Area availability for wheeled, motorized use same as Alternative A.
	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 44.3	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 17.0	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 12.0	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 38
	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 26.4	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 47.1	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 59.1	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 32.6
Snowmobile use	Open to cross-country snowmobile use except Ward Ranch, McMasters and Spokane Hills temporary closure areas.	Reduced cross-country snowmobile use from Alt. A, additional travel closures (includes cross country travel as well as travel on existing routes) for the area immediately west of the York Bridge ("Mount Bend"), the French Bar area, and BLM lands located adjacent to the Spokane Hills area.	Potential long-term effects to users because cross-country snowmobile use would not be allowed.	Less area open to cross-country snowmobile travel than with Alt. A, but more area open than with Alts. B and C.
	Area availability for snowmobile use (in acres) – Open: 15,066, Closed: 1,588, Limited: 3,612	Area availability for snowmobile use (in acres) – Open: 6,362, Closed: 13,904, Limited: 0	Area availability for snowmobile use (in acres) – Open: 0, Closed: 0, Limited: 20,266	Area availability for snowmobile use (in acres) – Open: 14,461, Closed: 5,805, Limited: 0

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRAVEL MAN				
	Miles of motorized routes available to snowmobile travel: 44.3	Miles of motorized routes available to snowmobile travel: 21.5	Miles of motorized routes available to snowmobile travel: 12	Miles of motorized routes available to snowmobile travel: 47.5
User conflicts	Conflict expected to increase as urbanization continues.	Separate use areas and decreased road density would lessen user conflicts.	Same as Alt. B	User conflict would be similar to Alt. A.
Illegal activities	Greatest level of illegal activities expected to occur.	Route closures across 60 percent of area would reduce illegal activities.	Same as Alt. B.	Same as Alt. A.
Road and trail safety	More accidents/injuries expected under Alt. A due to motorized and non-motorized users on more of the same routes.	More separate use areas and decreased road density would increase road and trail safety.	Same as Alt. B.	Same as Alt. A.
User compliance/ implementation	No additional effort/expenditures needed.	Costs would be greater under Alternative B than Alternatives A and D, due to the development of non-motorized trail heads.	More effort/cost required than under other alternatives to educate public on change in use and to monitor compliance.	Same as Alt. A.
Lewis and Clark County NW TPA				
Motorized/Non-motorized opportunities	Alt. A would have 47 percent more motorized routes than action alternatives. Non-motorized users would have fewer opportunities under Alt. A.	Opportunities for non-motorized users would be greater than Alts. A and D.	Alt. C would provide fewer opportunities for motorized users. Closure of routes in northwest corner of TPA would result in enhanced non-motorized opportunities.	Alt. D would provide more motorized opportunities than other action alternatives. Opportunities increased for ATV riders and hunters through yearlong ATV-only and game retrieval route.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
	Area availability for wheeled, motorized use (in acres) – Open: 0, Closed: 0, Limited: 16,997	Area availability for wheeled, motorized use same as Alternative A.	Area availability for wheeled, motorized use same as Alternative A.	Area availability for wheeled, motorized use same as Alternative A.
	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 64.2.	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 28.1.	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 19.7.	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 34.1.
	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 5.3	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 37.7.	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 46.7.	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 29.1.
Snowmobile use	Allows cross-country snowmobile use outside Great Divide Ski Area, greatest of all alternatives.	Reduced opportunities because northwest portion of TPA restricted to designated routes.	Potential long-term effects to users because cross-country snowmobile use would not be allowed.	Increase in snowmobile opportunities on designated routes compared to Alts. B and C.
	Area availability for snowmobile use (in acres) – Open: 16,112, Closed: 888, Limited: 0. Miles of motorized routes available to snowmobile travel: 56.5.	Area availability for snowmobile use (in acres) – Open: 12,649, Closed: 888, Limited: 3,463. Miles of motorized routes available to snowmobile travel: 50.8 (includes 1.8 miles of snowmobile only trail).	Area availability for snowmobile use (in acres) - Open: 0, Closed: 888, Limited: 16,112. Miles of motorized routes available to snowmobile travel: 9.1 (includes 1.1 miles of snowmobile only trail).	Area availability for snowmobile use same as Alternative B. Miles of motorized routes available to snowmobile travel: 51 (includes 2.0 miles of snowmobile only trail).
User conflicts	User conflict during winter due to snowmobile use; on Continental Divide Trail due to motorized and non-motorized use on the same trail.	User conflict reduced due to dispersed recreational opportunities. Rerouting Continental Divide Trail would enhance motorized/non-motorized conflicts.	Same as Alt. B.	Same as Alt. B. Restricted snowmobile use in northwest portion of TPA and Great Divide Ski Area would reduce winter use conflicts.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRAVEL MAN				
Boulder/Jefferson City TPA				
Motorized/Non-motorized opportunities	Alt. A would have the most open routes of all alternatives. No designated non-motorized routes. Fewer recreation opportunities for non-motorized users.	Provides more opportunities for non-motorized users than Alt. A.	Fewer opportunities for motorized users since least number of open routes. Increased non-motorized opportunities since routes in southwest corner of TPA closed to motorized use.	Opportunities for motorized uses would be greater than Alts. B and C but less than Alt. A.
	Area availability for wheeled, motorized use (in acres) – Open: 0, Closed: 0, Limited: 14,487	Area availability for wheeled, motorized use same as Alternative A.	Area availability for wheeled, motorized use same as Alternative A.	Area availability for wheeled, motorized use same as Alternative A.
Motorized/Non-motorized opportunities	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 60.5	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 28.8	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 23.5	Miles of wheeled motorized routes available (Open Yearlong, Seasonally Restricted): 38.1
	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 0	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 31.7	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 36.9	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 23.3
Snowmobile use	Alt. A would provide greatest opportunity for motorized winter use because TPA would be open to area-wide cross country use as well as on all existing routes.	Same as Alt. A.	Alt. C would provide fewest opportunities for snowmobiles since cross-country travel would not be allowed and fewer designated routes would be available.	Same as Alt. A.
	Area availability for snowmobile use (in acres) – Open: 14,487, Closed: 0, Limited: 0 Miles of motorized routes available to snowmobile travel: 60.5	Same as Alt. A.	Area Availability for snowmobile use (in acres) – Open: 0, Closed: 0, Limited: 14,487 Miles of motorized routes available to snowmobile travel: 3.0	Same as Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
User conflicts	Greatest potential for user conflict, due to lack of separate use areas and high level of motorized routes.	Conflicts between non motorized and motorized users would be less during the spring/summer/ fall use season but continue or increase during the winter use season.	Fewer user conflicts than other alternatives due to dispersed recreational opportunities.	Same as Alt. A.
Upper Big Hole River TPA				
Motorized/Non-motorized opportunities	Alt. A would have 38 percent more motorized routes than any other alternative. Alt. A would have fewest non-motorized opportunities.	Reduction by half of motorized opportunities due to seasonal restrictions or road closures. Non-motorized opportunities would be enhanced compared to Alt. A.	Fewest opportunities for motorized users due to least number of open routes. Non-motorized opportunities would be greatest.	Fewer opportunities for motorized use than Alt. A, but more than Alts. B and C.
	Area availability for wheeled, motorized use (in acres) – Open: 0, Closed: 0, Limited: 63,249	Area availability for wheeled, motorized use same as Alt. A.	Area availability for wheeled, motorized use same as Alt. A.	Area availability for wheeled, motorized use same as Alt. A.
	Miles of wheeled motorized routes available (Open Year-long, Seasonally Restricted): 158.6	Miles of wheeled motorized routes available (Open Year-long, Seasonally Restricted): 84.8	Miles of wheeled motorized routes available (Open Year-long, Seasonally Restricted): 60	Miles of wheeled motorized routes available (Open Year-long, Seasonally Restricted): 97.4
	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 11.0	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 76.9	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 106.9	Miles of non-motorized trails available (includes existing trails, as well as closed and decommissioned roads): 62.9
Snowmobile use	Provides greatest opportunities for snowmobile use since area-wide cross-country travel and use on existing routes generally allowed.	Fewer opportunities than Alternative A. Additional areas would be closed to cross-country travel, other areas restricted to designated routes during the season of use (12/2-5/15).	No cross-country travel allowed; travel restricted to designated routes only during the season of use (12/2-5/15).	Same as Alternative A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRAVEL MANAGEME				
	Area availability for snowmobile use (acres) – Open: 31,600, Closed: 31,607, Limited: 0	Area availability for snowmobile use (acres) – Open: 13,243, Closed: 46,932, Limited: 3,032	Area Availability for snowmobile use (acres) – Open: 0, Closed: 31,607, Limited: 31,600	Area Availability for snowmobile use (acres) – Open: 31,600, Closed: 31,607, Limited: 0
	Miles of motorized routes available to snowmobile travel: 90.2	Miles of motorized routes available to snowmobile travel: 60.6 (Includes 2.5 miles of snowmobile use only trail).	Miles of motorized routes available to snowmobile travel: 16.4 (Includes 2.4 miles of snowmobile use only trail).	Miles of motorized routes available to snowmobile travel: 92.7 (includes 2.5 miles of snowmobile use only trail).
User conflicts	Greatest user conflict due to least number of non-motorized trails available for recreation.	User conflicts would be reduced from Alt. A due to greater separation of motorized/non-motorized uses.	Least amount of user conflicts due to greatest number of non-motorized routes for dispersed use.	Same as Alt. B.
Road and trail safety	Greatest risk of road/trail accidents/injuries due to less separation of motorized/non-motorized uses and year-round river ford at Sawlog Gulch.	Improved public safety compared to Alt. A associated with greater separation of motorized/non-motorized uses and restricting vehicular crossing of Big Hole River from 12/2 – 7/15.	Most enhanced public safety due to greatest separation of motorized/non-motorized uses and elimination of river ford at Sawlog Gulch.	Less risk to public safety than under Alt. A but more than under Alts. B and C. Seasonal restriction on Sawlog Gulch to avoid fording river during high water.
TRANSP				
Field Office-Wide				
Road maintenance, monitoring and compliance, and weed control	Highest transportation facility costs than action alternatives due to more motorized routes.	Transportation facility costs would be less than Alts. A and D, and similar to Alt. C. Lower facility costs due to overall reduction in available routes despite increased design standards for stream crossings (culverts) and proposed barbed wire gate replacement.	Transportation facility costs would be less than Alts. A and D, and similar to Alt B. Lower facility costs due to overall reduction in available routes despite increased design standards for stream crossings (to withstand 100-year flood events) and as needed barbed wire gate replacement.	Transportation facility costs would be greater than Alts. B and D, but less than Alt. A. Lower facility costs due to overall reduction in routes despite increased design standards for stream crossings, complete barbed wire gate replacement, and new construction to provide additional loop routes.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Helena TPA				
Road signing, maintenance, monitoring, and compliance	Short-term lower costs for signage and compliance monitoring since fewer route restrictions.	Short-term increase in costs for trailhead maintenance, gates, and signage associated with restricted motorized access, and compliance costs associated with nighttime closure of the Scratchgravel Hills.	Same as Alt. B.	Short-term increase in cost for signage and long-term increase compared to Alts. B and C for route maintenance associated with constructing new connector routes and reconstructing existing routes.
Overall costs of facility maintenance	Overall transportation facility costs would be highest of all the action alternatives; almost three times more than Alts. B and D, and six times more than Alt. C.	Overall transportation facility costs would be less than Alts. A and D due to fewer open routes to maintain, but more than Alt. C.	Due to the overall reduction in available routes, transportation facility costs would be least of all the alternatives.	Overall transportation facility costs would be greater than Alts. B and C, but less than Alt. A.
East Helena TPA				
Road signing, maintenance, monitoring, and compliance	Short-term lower costs for signage and compliance monitoring since fewer route restrictions.	Short-term increase in cost for compliance monitoring effort, trailhead development, and maintenance for trailheads in North Hills and for signage and sign maintenance for hunters with a disability access in South Hills.	Short-term increase in costs for compliance monitoring, signage to mark restricted routes. Indirect costs for sign maintenance and replacement greater than other alternatives.	Short-term increase in costs for compliance monitoring, signage and long-term increase for route maintenance associated with constructing new routes.
Overall costs of facility maintenance	Overall transportation facility costs would be similar to Alt. D and much less than Alts. B and C.	Overall transportation facility costs would be less than Alts. A and D and more than Alt. C.	Due to the overall reduction in available routes, transportation facility costs would be least of all the alternatives.	Overall transportation facility costs would be similar to Alt. A and less than Alts B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
TRANSP				
Lewis and Clark County NW TPA				
Road signing, maintenance, monitoring, and compliance	Short-term lower costs for signage and compliance monitoring since fewer route restrictions.	Short-term increase in costs for additional signage and compliance monitoring and from closing upper northwest portion of area to motorized vehicles and cross-country snowmobile travel.	Short-term increase in costs for additional signage and monitoring compliance and due to closing entire northwest portion of TPA to motorized vehicles and cross-country snowmobile travel.	Short-term increase in costs due to new signage and monitoring compliance and maintenance associated with addition of new routes including ATV-only and game retrieval route, and closing northwest portion of TPA to cross-country snowmobile travel.
Overall costs of facility maintenance	Overall transportation facility costs would be greatest of all alternatives since highest level of motorized access.	Overall transportation facility costs would be similar to Alt. D, less than Alt. A and more than Alt. C.	Due to the overall reduction in available routes, transportation facility costs would least of all the alternatives.	Overall transportation facility costs would be greater than Alts. B and C, but less than Alt. A.
Motorized trail maintenance	No costs for motorized trail maintenance.	No costs for motorized trail maintenance.	No costs for motorized trail maintenance.	Only alternative with motorized trail maintenance.
Boulder/Jefferson City TPA				
Road signing, maintenance, monitoring and compliance	Short-term lower costs for signage and compliance monitoring since fewer route restrictions.	Short-term increase in costs for signage and compliance monitoring effort compared to Alt. A.	Short-term increase in costs for additional signage and compliance monitoring effort and due to closing southwest corner of TPA to motorized use and entire area to cross-country snowmobile travel.	Short-term increase in costs for signage and compliance monitoring effort.
Overall costs of facility maintenance	Greatest overall transportation facility costs due to the greatest level of motorized access.	Overall transportation facility costs would be less than Alts. A and D and more than Alt. C.	Due to the overall reduction in available routes, transportation facility costs would be the least of all the alternatives.	Overall transportation facility costs would be greater than Alts. B and C, but less than Alt. A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Upper Big Hole River TPA				
Road signing, maintenance, monitoring and compliance	Lower costs for signage and compliance monitoring since fewer route restrictions.	Short-term increased costs from new signage and compliance monitoring due to changing seasonal use restrictions in various areas and closing some areas to cross-country snowmobile travel.	Short-term increase costs for new signage and compliance monitoring due to route closures and seasonal restriction changes and closing some areas to cross-country snowmobile travel.	Short-term increase in costs due to new signage and compliance monitoring due to route restrictions in various areas and closure of some areas to cross-country snowmobile travel.
Overall costs of facility maintenance	Transportation facility costs would be almost twice that of the action alternatives due to the highest level of motorized access.	Overall transportation facility costs would be more than two times less than Alt. A, more than Alt. C and slightly less than Alt. D.	Due to the overall reduction in available routes, transportation facility costs would be the least of all alternatives.	Overall transportation facility costs would be substantially less than Alt. A due to a great reduction in motorized access and slightly higher than Alts. B or C.
LANDS AND RE				
Renewable energy	Renewable energy developments could result in requests for land use authorizations.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Facility locating	Would provide greatest flexibility in locating transmission lines, pipelines, and communication sites since no designated right-of-way corridor, use areas, exclusion areas, and limited avoidance areas would be identified.	Limiting new communication facilities to seven designated communication sites would concentrate these uses and diminish proliferation of separate rights-of-way. Designating utility corridors would focus locations of future facilities.	Same as Alternative B.	Same as Alternative B.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
LANDS AND RE				
Land ownership adjustment	No Change.	Would improve and provide better guidance by prioritizing actions associated with chronic management problems and protecting public resource values. Focus on identifying areas for future acquisitions associated with special designations and special status/priority species habitat.	Same as Alternative B.	Same as Alternative B.
SP				
ACECs				
	Existing ACEC (Sleeping Giant) only area managed as an ACEC totaling 11,679 acres.	Four potential areas would be designated as ACECs totaling 70,644 acres. This alternative would provide the second greatest protection of relevant and important values.	This alternative provides the greatest protection of relevant and important values since all five potential areas totaling 87,893 acres would be designated as ACECs.	The second least amount of ACECs (three) and acreage (23,695 acres) would be designated as ACECs.
National Trails				
	Lowest protection provided for the two National Trail corridors given that ROS, VRM, travel and oil and gas restrictions would be lowest.	Second highest protection afforded the National Trails as resource use restrictions would be greater than Alts. A and D.	Greatest protection of the existing National Trails and associated user experiences since all resource uses such as timber harvesting, motorized travel, rights-of-way, minerals, and oil and gas would be restricted the most through ROS, VRM, and travel management.	Second lowest protection for National Trails as potential impacts from other resource uses would be higher than Alts. B and C.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Wild and Scenic Rivers				
	Outstandingly remarkable values of all WSR eligible segments would be minimally affected as interim protective measures would be applied until suitability decisions were made.	Only two of the four eligible WSR segments would be recommended as suitable for NWSRS (Muskrat Creek and Upper Missouri River). The remaining two segments would be dropped from consideration.	All four segments would be recommended as suitable for consideration in NWSRS; interim management would be the same as Alternative A. The potential for long-term protection of the outstandingly remarkable values would be greatest of all alternatives.	Least protection provided for the WSR values as no river segments would be recommended as suitable for WSR management status.
Wilderness Study Areas (Fall back management if removed from wilderness consideration)				
	Sleeping Giant and Sheep Creek WSAs would be managed as ACECs under the current Sleeping Giant ACEC Management Plan.	Four WSAs would be managed as ACECs providing some long-term resource value protection should Congress remove them from further wilderness consideration. Yellowstone River Island and Black Sage would be managed to protect their natural characteristics and outstanding values to a greater degree than Alt. D and a lesser degree than Alt. C.	Same as Alternative B, with the exception that oil and gas stipulations would be more restrictive for Black Sage (and protective of existing values) if dismissed from further wilderness consideration.	Same as Alternative B, with the exception that Black Sage would be open to all salable and leasable minerals and less protective oil and gas leasing stipulations of Alt. D.
SOCIAL AND ECO				
Economic Environment				
Agricultural and livestock use	Livestock grazing (actual use) would support 10 total (direct, indirect, induced) jobs and total labor income of $198,000.	Livestock grazing (estimated actual use) would support 10 total (direct, indirect, induced) jobs and total labor income of about $180,000.	Same as Alt. B, i.e. livestock grazing (estimated actual use) would support about 10 total (direct, indirect, induced) jobs and total labor income of about $183,000.	Same as Alternative A

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
SOCIAL AND ECO				
	Dependency of local livestock operators on BLM forage would remain at less than 1 percent of total livestock forage needs. Approximately 185 operators have grazing permits on BLM public lands. BLM forage often provides a critical element of the livestock producer's matched complement of grazing, forage, and hay production. Livestock grazing would continue to generate about $35,000 in annual government revenues; $8,400 would be distributed to the state and counties.	Changes in grazing management and economic effects would be spread unequally among permittees. Dependency and government revenues would be similar to Alternative A.	Changes in grazing management and economic effects would be spread unequally among permittees. Dependency and government revenues would be similar to Alternative A.	
Forest products	The combined effect of 9,800 CCF of timber sales would be 110 total jobs and $3.0 million in annual labor income.	The combined effect of 9,200 CCF of timber sales would be 100 total jobs and $2.8 million in annual labor income.	The combined effect of 4,100 CCF of timber sales would be 50 total jobs and $1.3 million in annual labor income.	The combined effect of 10,800 CCF of timber sales would be 120 total jobs and $3.3 million in annual labor income.
Recreation	An estimated 800 total local jobs and $20.6 million in total annual labor income would be supported by 1.33 million recreation visits per year on public lands. The amount of revenues generated by recreation management would be $123,000.	An estimated 790 total local jobs and $20.3 million in total annual labor income would be supported by 1.31 million recreation visits per year on public lands. Recreation revenues would be similar to Alternative A.	An estimated 780 total local jobs and $20.1 million in total annual labor income would be supported by 1.3 million recreation visits per year on public lands. Recreation revenues would be similar to Alternative A.	An estimated 800 total local jobs and $20.5 million in total annual labor income would be supported by 1.33 million recreation visits per year on public lands. Recreation revenues would be similar to Alternative A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
Mining and mineral	An estimated 90 local jobs and $4.6 million in annual labor income would be supported by exploration, development, and production of 980,000 MCF of gas, 330,000 tons of limestone, 400 tons of dimension stone, and 20,000 tons of sand/gravel. Federal revenues from leases, rents, and royalties would be about $960,000. State and local revenues would be $480,000 and $100,000, respectively.	Economic impacts would be similar to those described for Alternative A.	The number of local jobs annual labor income supported by exploration, development, and production of 330,000 tons of limestone, 400 tons of dimension stone, and 20,000 tons of sand/gravel would be similar to current management. There would be no federal, state, or local revenues from leasing, rents, or royalties.	Economic impacts would be similar to those described for Alternative A.
Ecosystem Restoration	Ecosystem restoration activities, e.g. fuels treatments and pre-commercial thinning (1,275 acres), weed spraying (2,000 acres), and road closures (172 miles) would support about 10 jobs and $340,000 in labor income annually.	Ecosystem restoration activities, e.g. hazardous fuels treatments and pre-commercial thinning (2,560 acres), weed spraying (2,900 acres), road decommissioning (5 miles), and road clo*sures (318 miles)* would support about 20 jobs and $590,000 in labor income annually.	Ecosystem restoration activities, e.g. hazardous fuels treatments and pre-commercial thinning (450 acres), weed spraying (2,200 acres), road decommissioning (5 miles), and road closures (375 miles) would support less than 10 jobs and about $250,000 in labor income annually.	Ecosystem restoration activities, e.g. hazardous fuels treatments and pre-commercial thinning (3,345 acres), weed spraying (3,600 acres), road decommissioning (4 miles), and road closures (266 miles) would support about 20 jobs and $750,000 in labor income annually.
BLM management effects on the local economy	BLM management would support about 1,270 local jobs and $37.7 million in local labor income. This would be about 0.7 percent of total local jobs and 0.6 percent of total local labor income.	BLM management would support about 1,260 local jobs and $37.8 million in local labor income. This would be about 0.7 percent of total local jobs and 0.6 percent of total local labor income.	BLM management would support about 1,100 local jobs and $31.3 million in local labor income. This would be about 0.6 percent of total local jobs and 0.5 percent of total local labor income.	BLM management would support about 1,300 local jobs and $39.3 million in local labor income. This would be about 0.7 percent of total local jobs and 0.6 percent of total local labor income.

Table 2-24
Summary Comparison of Effects by Alternative

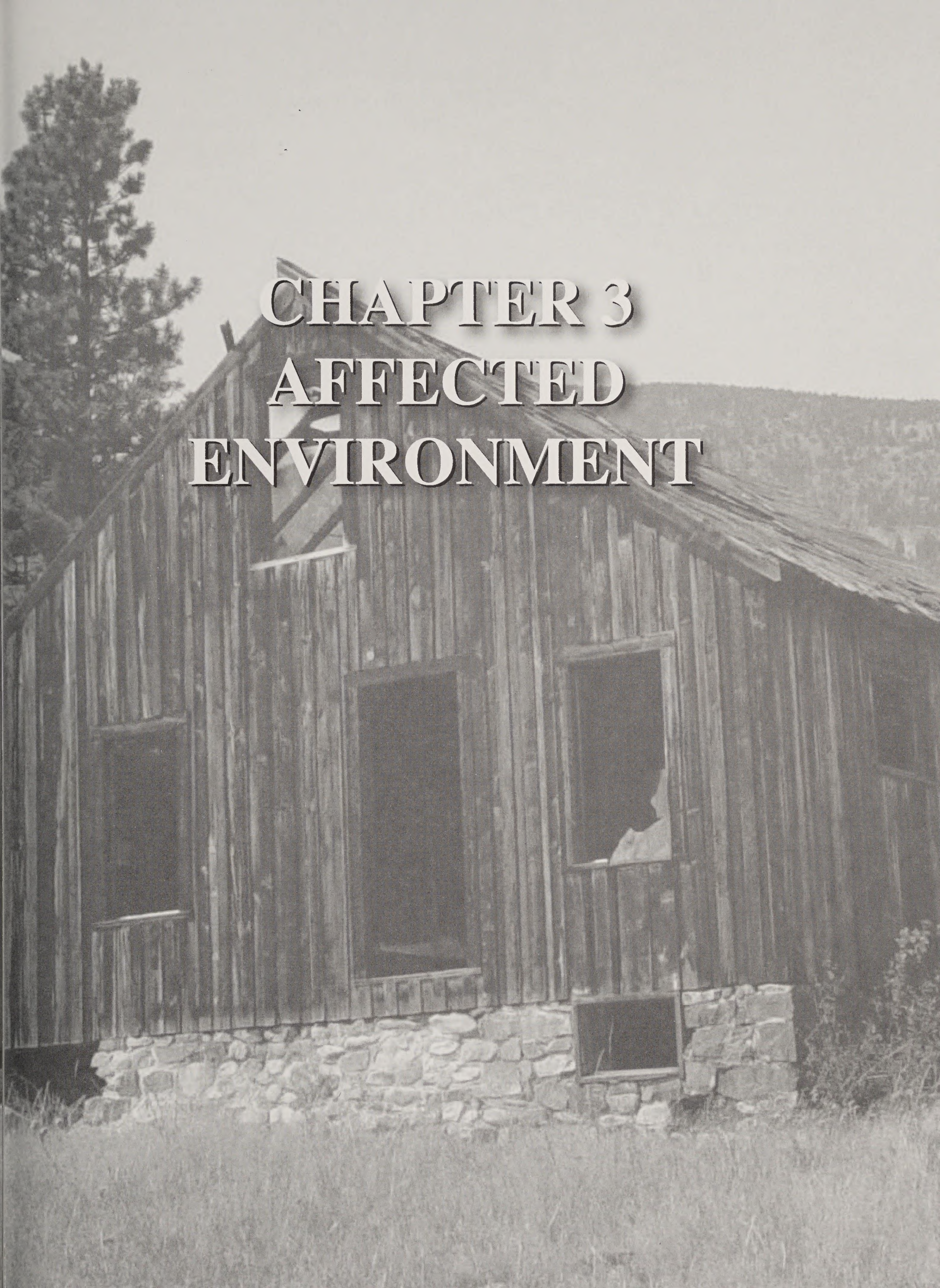
Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
SOCIAL AND ECO				
Econom				
Indirect non-market and non-use values	Based strictly on the number of acres that would be in an ACEC, Alternative A would have the lowest non-use values.	Based strictly on the number of acres that would be in an ACEC, Alternative B would have the second highest non-use values.	Based strictly on the number of acres that would be in an ACEC, Alternative C would have the highest non-use values.	Based strictly on the number of acres that would be in an ACEC, Alternative D would have the second lowest non-use values.
Economic stability, diversity, and growth	Economic stability (indicated by seasonal unemployment, sporadic population changes, and fluctuating income growth rates) and economic diversity (indicated by the number of economic sectors) would not be influenced by BLM resource management. Alternative C and to a lesser extent, Alternative B would indirectly provide an environment more conducive to continuing long-term population growth and corresponding economic growth because of more resource protection offered.			
Weed management	Economic benefits from weed management and costs (in terms of reduced agricultural output, reduced recreation use, increased soil loss and water pollution (sedimentation and turbidity) associated with the spread of weeds are unknown.			
Soil and water	Economic benefits from soil and water management and costs (from lost agricultural production, additional costs for municipal water treatments, shortened life of dams and reservoirs, additional cost of water for industrial purposes, reduced water recreation use, reduced soil productivity, and water pollution) associated with resource use are unknown.			
Fire/Fuels	Economic benefits from fire and fuels management (beyond those covered under forestry management) and potential costs (in terms of property losses, lost revenues from wildland fires, and increase suppression costs) associated with hazardous fuels buildup are unknown.			
Social and Economic Goals	All alternatives would, to varying degrees, provide opportunities for economic benefits while minimizing adverse impacts on resources and resource uses; sustain, and where appropriate, restore the health of forest, rangeland, aquatic, and riparian ecosystems to provide a sustained flow of economic benefits within the capability of the ecosystem; protect visual quality, wildlife habitats, and recreation opportunities to sustain non-market values; and make resource commodities available to provide a sustainable flow of economic benefits within the ecosystem.			
Environ				
	No disproportionately high and adverse human health or environmental effects on minority and low income populations would occur.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
P				
Abandoned mine reclamation	Reclamation of abandoned mine sites would continue to remediate safety and environmental quality issues.	Same as Alternative A. AML program would reclaim shaft in Ringing Rocks potential ACEC reducing safety hazard.	Same as Alternative A.	Same as Alternative A.
Haz				
	Land use authorizations not issued for uses involving disposal or storage of hazardous materials. Lands proposed for acquisition or disposal would be inventoried for hazardous materials.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Socia				
Timber and Logging Interests	No change to current social conditions under this alternative.	Alt. B would be favored over Alts. A and C by timber industry and workers because it provides for higher projected harvest levels and availability of forest products.	Alternative C would have the lowest projected harvest levels and therefore, would be less likely to be favored by those concerned about timber employment.	Likely to be the most favored alternative by the timber industry and workers concerned about employment because highest projected timber harvest levels.
Ranching/Livestock Permittee Interests	No change in authorized AUMs; projected levels of grazing would be maintained at current levels	Effects would be similar to Alternative A, but conflicts between livestock grazing and wheeled vehicles would be addressed.	Effects would be similar to Alternative B.	Effects would be similar to Alternative B.
Recreation Interests	Most roads open under this alternative. Would not address concerns about conflicts between motorized and non-motorized use.	Emphasized balance of motorized and non-motorized recreation and access. Entire Scratchgravel Hills closed to wheeled motorized use yearlong (with the exception of routes to residences.	Overall effect of reducing motorized recreation, but quality of experience may increase because user conflicts reduced. Scratchgravel Hills closed after dark.	Emphasis on motorized recreation. Motorized use of Scratchgravel Hills would be allowed 24 hours per day; would address some concerns about conflicts between motorized and non-motorized uses.

Table 2-24
Summary Comparison of Effects by Alternative

Resource or Aspect of Management	Alternative A (No Action)	Alternative B (Preferred Alternative)	Alternative C	Alternative D
SOCIAL AND ECO				
Commercial Outfitter and Guide Interests	Favored by outfitter guides over Alternatives B and C because fewer constraints.	Outfitters/ guides less likely to favor Alternative B because more constraints on their operations.	Outfitter/guides less likely to favor Alternative C because of more constraints on their operations.	Favored by outfitters/guides because fewest constraints.
Groups/Individuals who give a high priority to resource protection	Groups and individuals who give high priority to resource protection would be less likely to support this alternative than Alternatives B or C.	Groups and individuals who give high priority to resource protection would be likely to favor this alternative over Alternatives A and D, but may be less likely to favor this Alternative over Alternative C.	Groups and individuals who give high priority to resource protection would likely favor Alternative C because of wildlife and riparian habitat protection and establishment of WSRs and greatest acreage in new ACECs.	Groups and individuals who give high priority to resource protection would be less likely to favor Alternative D than the other action alternatives.
Groups/Individuals who give a high priority to resource use	Groups and individuals concerned about resource use would probably favor this alternative or Alternative D.	Groups and individuals who give high priority to resource use would be more likely to favor Alternative B over Alternative C, and possibly Alternative A.	Groups and individuals who give high priority to resource use would less likely favor Alternative C because timber harvest, oil & gas development, etc. would be more restricted than under Alternatives B and D.	Groups and individuals who give high priority to resource use would be likely to favor Alternative D because timber harvest would be highest and oil and gas constraints would be less restrictive.
Tribal R				
	Provides opportunity to exercise tribal treaty rights such as hunting, fishing, and gathering on public lands.	Same as Alternative A	Same as Alternative A	Same as Alternative A



CHAPTER 3
AFFECTED ENVIRONMENT

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INTRODUCTION

The information in this chapter is a summary of the information provided in the Analysis of the Management Situation (AMS), which was distributed for public review. The AMS contains information on the current management policies and regulations, more detail on the existing condition of some resources, habitat requirements for fish and wildlife species, information on current trends, and the resource specialists' determination of where change is needed in the current management direction. Maps from the AMS are referenced in this chapter as **AMS Figures** and are included electronically in PDF format on a compact disc with this document.

Throughout this document, the term "Planning Area" (PA) refers to the eight-county area with land administered by the BLM's Butte Field Office. The term "Decision Area" (DA) refers to all surface and subsurface (mineral estate) BLM-managed public lands in the PA.

HOW TO READ THIS CHAPTER

Chapter 3 provides information on the current condition of resources, resource uses, and programs that could be affected by the revised RMP alternatives described in Chapter 2. This chapter is organized into Resources, Resource Uses, Special Area Designations, and Social and Economic. Each of these sections is further divided into resources or program areas. This is the organization prescribed in the BLM guidance (USDI-BLM 2005a).

RESOURCES

AIR QUALITY

Several sensitive ecological areas designated by the Prevention of Significant Deterioration regulations as Mandatory Class I Areas are located within and near the PA airshed. These Class I areas include:

- Anaconda-Pintler Wilderness in western Deer Lodge County.
- Gates of the Mountains Wilderness in Lewis and Clark County.
- Scapegoat Wilderness in Lewis and Clark County.
- Yellowstone National Park (northern and northwestern portions) in Gallatin County.

Potentially affected Class I areas near the PA include the Bob Marshall Wilderness, which abuts Lewis and Clark County's western border, Glacier National Park, about 25 miles north of Lewis and Clark County, and the Red Rock Lakes Wilderness, located approximately 15 miles west of the southern part of Gallatin County.

Although air quality in most of the PA airshed is considered excellent, localized issues in some urbanized centers do not comply with the applicable EPA National Ambient Air Quality Standards (NAAQS) and the Montana Ambient Air Quality Standards (MAAQS) for certain pollutants designated as criteria pollutants by the Clean Air Act. Consequently, the EPA has designated two areas as "non-attainment areas":

- City of Butte, which is rated as not attaining standard conditions (non-attainment category) for coarse, inhalable particulate matter having an aerodynamic diameter of 10 microns or less (this category of particulate matter pollutants is referred to as PM_{10}),
- City of East Helena, which is in the non-attainment category for lead.

Currently, there are no non-attainment designations for fine particulate matter ($PM_{2.5}$) within the Planning Area. The closest non-attainment designation is Lincoln County in the far northwest portion of the state of Montana.

Air Quality Monitoring and Standards

The state of Montana maintains a network of ambient air quality monitoring stations. Pollutant monitoring is performed in Belgrade, Bozeman, Butte (two stations), Helena (two stations), Lincoln, and West Yellowstone (two stations). Seven of these nine stations monitor PM_{10} on a daily (24-hour) basis. Two of these stations also monitor PM_{10} continuously, while three monitor daily $PM_{2.5}$ as well. Two different stations are equipped to continuously monitor ambient air concentrations of carbon monoxide.

Maximum measured ambient air concentrations for the criteria pollutants in Gallatin, Silver Bow, and Lewis and Clark Counties for 2003, from EPA's AirData database system (USEPA 2004), are presented in **Table 3-1**. This is the most complete recent data set available through the EPA. Data from these monitoring stations indicate that there were no exceedences of national or Montana ambient air quality standards in 2003. No monitoring station in the East Helena non-attainment area is currently reporting data on lead emissions. The most recent data available for lead in EPA's ambient air database is for the year 2001, and shows compliance with national standards for lead emissions.

Air quality issues center mainly on sources of particulate emissions. PM_{10} are emitted by industrial plants such as mines, quarries, and sawmills that produce dust from mechanical operations. Other common sources of PM_{10} are vehicle traffic on paved and unpaved roads and smoke and dust and exhaust from construction or development activities. Most $PM_{2.5}$ in ambient air is believed

Table 3-1
Background Criteria Air Pollution Data

Pollutant	Averaging Time	Federal (NAAQS)	Montana (MAAQS)	Maximum Monitored Value (2003)[a,b]		
				Gallatin	Silver Bow	Lewis and Clark
Carbon Monoxide	Hourly	35 ppm	23 ppm	8.6 ppm	5.5 ppm	NDA
	8-Hour	9 ppm	9 ppm	2.1 ppm	4.0 ppm	NDA
Ozone	1-hour	0.12 ppm	0.10 ppm	NDA	NDA	0.079 ppm[3c]
	8-hour	0.08 ppm	--	NDA	NDA	0.065 ppm[3c]
Lead	90-Day	--	1.5 $\mu g/m^3$	NDA	NDA	NDA
	Quarterly	1.5 $\mu g/m^3$	--	NDA	1.02 $\mu g/m^{3,d}$	NDA
Sulfur Dioxide	Hourly	--	0.50 ppm	NDA	NDA	NDA
	3-Hour	0.50 ppm	--	NDA	NDA	0.10 ppm [d]
	24-Hour	0.14 ppm	0.10 ppm	NDA	NDA	0.03 ppm [d]
	Annual	0.03 ppm	0.02 ppm	NDA	NDA	NDA
Coarse Particulate Matter (PM_{10})	24-Hour	150 $\mu g/m^3$	150 $\mu g/m^3$	68 $\mu g/m^3$	49 $\mu g/m^3$	83 $\mu g/m^3$
	Annual	--	50 $\mu g/m^3$	26 $\mu g/m^3$	16 $\mu g/m^3$	23 $\mu g/m^3$
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	35 $\mu g/m^3$	--	23 $\mu g/m^3$	39 $\mu g/m^3$	29 $\mu g/m^3$
	Annual	15 $\mu g/m^3$	--	8.1 $\mu g/m^3$	8.3 $\mu g/m^3$	6.8 $\mu g/m^3$

NDA = No Data Available; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter

[a] Data in table is for maximum values reported in the year 2003 with the exception of annual particulate matter results, which are presented as the annual geometric mean.

[b] Monitoring data are not available through the EPA AirData Database for Nitrogen Dioxide (NO_2) and Ozone (O3) since no counties within the PA have monitoring stations for these pollutants.

[c] The Ozone result presented for Lewis and Clark County was measured at the Glacier National Park monitoring station in Flathead County. This station is in the impact zone for Ozone precursors emitted in parts of the PA.

[d] The latest available data for lead and sulfur dioxide are those from calendar year 2001.

to arise from combustion processes or atmospheric reactions among naturally occurring or industrial pollutants. Both forms of particulate matter are inhalable and penetrate the lungs, where they may be deposited. This is the primary reason for EPA's regulation of these particles at different levels.

Particulate emissions of both types within the PA are produced during prescribed burns of timber and underbrush by forest management, as well as wildland fire, private debris burning, agricultural burning, slash burning, and wood burning stoves and fireplaces. These emission situations are generally transitory and do not pose significant risks to human health because exposures can often be minimized or avoided. However, smoke from large fires, particularly $PM_{2.5}$, can traverse great distances, sometimes thousands of miles, and can impact visibility in nearby and even distant Class I areas. Air quality and visibility can also deteriorate locally due to temporary air stagnation events.

The Montana/Idaho Airshed Group has developed a Smoke Management Program to address smoke production from wildland and prescribed fires. Accumulation of smoke from controlled burning is limited through monitoring of weather conditions and formal coordination of activities through the Monitoring Unit in Missoula, Montana. The Monitoring Unit decides daily on burning within a particular airshed depending on adequate smoke dispersion. Airsheds in the PA are Airsheds 5, 6, 7, 8A and 8B.

Climate

The climate of the region is modified northern Pacific Coast type with continental components. **Table 3-2** provides a sampling of data recorded within the PA. The Rocky Mountains exert the main influence on climate. Winter days are marked by cold temperatures and cloudy days. Winter Chinook winds blow frequently from 25 to 50 miles per hour and can create warm, windy days east of the Continental Divide, while temperatures remain steadier in the mountain valleys. In the summer, the heat and dry conditions are somewhat modified by mountainous terrain west of the PA.

Table 3-2
Sampling of Climate Data in Planning Area

Parameter	Bozeman: Montana State Univ.	Butte: FAA Airport	Gardiner	Helena: Weather Service Office
Period of Record	1892–2003	1894–2003	1956–2003	1893–2003
Average Maximum Temperature	81.0°F	79.7°F	85.9°F	82.7°F
Month of Average Maximum Temperature	July	July	July	July
Average Minimum Temperature	11.8°F	7.3°F	13.7°F	11.2°F
Month of Average Minimum Temperature	January	January	January	January
Average Annual Precipitation	18.26 in.	12.77 in.	9.89 in.	11.94 in.
Average Annual Snowfall	85.1 in.	56.8 in.	25.2 in.	51.3 in.
Annual Mean Wind Speed	NDA	NDA	NDA	7.7 mph
Annual Prevailing Wind Direction	NDA	NDA	NDA	West

in. = inches; °F = degrees Fahrenheit; FAA = Federal Aviation Administration; mph = miles per hour; NDA = No Data Available

Global Climate Change

On-going scientific research has identified the potential impacts of anthropogenic "greenhouse gas" (GHG) emissions (including carbon dioxide, CO_2; methane; nitrous oxide; water vapor; and several trace gases) on global climate. Through complex interactions on a regional and global scale, these GHG emissions cause a net warming effect of the atmosphere (making surface temperatures suitable for life on earth), primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO_2 concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC 2007a) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] greenhouse gas concentrations."

Global mean surface temperatures have increased nearly 1.8°F (1.0°C) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24° N) have exhibited temperature increases of nearly 2.1°F (1.2°C) since 1900, with nearly a 1.8°F (1.0°C) increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2001, the IPCC indicated that by the year 2100, global average surface temperatures would increase 2.5 to 10.4°F (1.4 to 5.8°C) above 1990 levels. The National Academy of Sciences (2006) has confirmed these findings, but also indicated that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures.

Over the last century, the average temperature in Helena, Montana, has increased 1.3°F, and precipitation has decreased by up to 20 percent in many parts of the state (USEPA 1997, Hansen et al. 2001). Over the next century, climate in Montana may change even more. Similar temperature changes have occurred in the past, but the previous changes took place over centuries or millennia instead of decades. One confounding issue in determining whether GCC is actively affecting conditions in the Planning Area is what is apparent from long-term climate data.

In many cases it is inherently difficult to discern whether global climate change in and of itself is already affecting resources in Montana, let alone the Planning or Decision Areas for the Butte RMP. This is particularly difficult in the context of multiple mechanisms or causes contributing to the resource conditions that currently exist. In most cases there is more information about potential or *projected* effects of GCC on resources. It is important to note that projected changes are likely to occur over several decades to a century.

While it is difficult to specifically determine current effects of global climate change on resources in the Butte RMP Planning Area, a number of projected effects are forecasted to occur over the coming decades. The Environmental Protection Agency (Region 8) predicts

that for the region of the United States that includes Montana, a number of predicted effects of climate change will occur. These predicted changes include (USEPA 2008):

- The region will experience warmer temperatures overall, with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations, leading to less snow.
- Earlier snowmelt means peak streamflows will be earlier, weeks before the peak needs of farmers, ranchers, rafters, and others. In late summer, rivers, lakes and reservoirs will be drier.
- More frequent, more severe, and possibly longer-lasting droughts will occur.
- Crop and livestock production patterns could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Drier summer conditions will reduce the range and health of ponderosa and lodgepole pine forests, and increase susceptibility to fire. Grasslands and rangeland could expand into previously forested areas.
- Ecosystems will be stressed and a number of wildlife species such as the mountain lion, black bear, pine marten, and bald eagle could be further stressed.

Geologic Resources

Seismic activity (earthquakes), landslides, rock falls, earth flows, slumps, debris flow, and avalanches are all examples of geologic hazards that can occur within the PA. A belt of seismic activity, known as the Intermountain Seismic Belt, is about 100 miles wide and extends through western Montana from near Kalispell in the northwest corner of the state to Yellowstone National Park in the southwest. Within the Intermountain Seismic Belt, approximately 70 mostly high-angle, steep-range bounding faults are known to have been active in the last 1.6 million years, and more than 5,000 earthquakes have been recorded since 1982, according to the Montana Bureau of Mines and Geology (MBMG 2005).

Almost the entire PA is included in the Intermountain Seismic Belt. A branch of the Intermountain Seismic Belt, called the Centennial Tectonic Belt, extends west from the northwest corner of Yellowstone Park, through southwestern Montana, and into central Idaho. The Centennial Tectonic Belt includes at least eight major active faults. The site of the largest historic earthquake in the northern Rocky Mountains, the August 18, 1959 Hebgen Lake, Montana earthquake (magnitude 7.5), is located in the southwestern-most portion of the PA. Although it has been over four decades since the last destructive earthquake in Montana, small earthquakes are very common in the region, averaging 7 to 10 per day (http://mbmgquake. mtech.edu).

Landslides, earth flows, and slumps are common where 1) slopes are steep, and 2) impermeable ground conditions occur, seasonally or otherwise, that result in saturated soils or areas of high moisture content. In addition to natural processes such as earthquakes, road building and vegetation removal in areas of steep terrain can also trigger landslides.

Debris flows are comprised of fluidized sediments that rapidly move downslope, forming channels of saturated, viscous, slurry-like material. They usually occur in association with very high rainfall or rapid snowmelt events. They typically affect only small areas, with the greatest erosion occurring in the flow channels. Debris flows can destroy roads and bridges in their paths, and can cause physical injury or property damage.

Rock falls are common in many areas and are associated with locally steep terrain, road cuts, stream valleys, cliffs, peaks, and ridges. Rock falls can be triggered by temperature fluctuations, precipitation events, or seismic activities.

Snow avalanches are large masses of snow or ice in swift motion down a mountainside or over a precipice. Snow slides commonly occur in chutes near mountain peaks and along ridges. Both human activity and natural processes can trigger an avalanche.

Soil Resources

Soils were surveyed and are available for the PA including Broadwater, Deer Lodge, Gallatin, Jefferson, and Lewis and Clark counties. Soils were surveyed in Beaverhead, Park and Silver Bow counties. The data is not yet completed and published although some is available through the NCSS Web Soil Survey (NRCS 2004a). Three major geologic units found include the older Precambrian Belt Series sedimentary rocks, Boulder batholith granite and related rocks, and younger Tertiary volcanic and sedimentary deposits. In addition, mountain glaciations during the more recent Quaternary period helped shape and carve the mountain topography. Eroded bedrock from the mountains was deposited in the adjacent valleys.

The granitic Boulder batholith commonly weathers to weakly-developed sandy texture soil horizons over coarse sand to slightly decomposed granite subsurface layers.

Soils that have developed from Belt Series bedrock typically are fine sandy or loamy soils with high percentages of coarse fragments (Veseth and Montagne 1980). The soils are non-calcareous except for specific areas where calcareous strata (impure limestone) is exposed at or near the surface.

Soils in the Tertiary valley-fill can be highly variable in physical and chemical properties due to the inherent

variability of the source rock. The soils in this landscape setting may also have formed from more recent Quaternary sediments or other bedrock deposits.

The basic soil mapping units of the Soil Survey Geographic Database and National Soil Information System can be correlated with the underlying igneous rocks, limestone, or argillite, or mixed colluvial and alluvial deposits. Of the five basic soils forming factors (climate, organisms, parent material, topography, and time), parent material, and topography primarily influence the development of soils in the PA.

WATER RESOURCES

The PA generally consists of headwaters of the Missouri River (Big Hole River, Jefferson River, Madison River, and Gallatin River) and to a lesser extent, the Yellowstone River and Clark Fork River.

Topography varies from steep rugged mountains of the Madison, Gallatin, Bridger, Crazy, and Absaroka ranges to broad grassy valleys around the towns of Bozeman, Butte, and Helena. Elevations range from 11,200 feet in the Absaroka Range to 3,400 feet along the Missouri River below Holter Lake.

Precipitation patterns are affected primarily by local terrain. Mountain ranges cause rain shadow and other orographic effects, resulting in variations in annual precipitation from 10 to 15 inches in the valleys to 30 to 60 inches in the mountains (Western Regional Climate Center 2004). May and June are the wettest months; however, moisture from mountain snowpack typically sustains the major streams and rivers all year.

The EPA has determined that streams and rivers, or segments fail in achieving beneficial use(s) as designated by the MDEQ and are therefore considered impaired. Impairment status is based on numeric and narrative criteria for chemical, physical, and biological conditions of each water body. Each of the impaired water bodies is evaluated by the state to determine how to attain their beneficial uses by meeting TMDL limitations. As such, any water body in the Decision Area, and possibly portions of the PA, that is on the Section 303(d) List is considered adversely impacted until removed from the List. Impaired water bodies in the DA based on the Section 303(d) List for Montana (MDEQ, 2006) are listed in **Table 3-3**.

Table 3-3
Impaired Water Bodies by 4th Level Hydrologic Unit Code 2005 Survey

4th Hydrologic Unit Code	Stream Segment Within BLM Land	Miles Within BLM Land	Probable Impairment Type(s)[A]	Probable Impairment Source(s)[B]
Big Hole River (10020004)	Big Hole River	8.83	1, 2, 4, 8, 10	1, 4, 6, 8, 10, 17, 18
	Camp Creek	1.51	1, 2, 5, 8, 10	9, 10, 12, 18
	Charcoal Creek	1.34	5, 6, 8	10, 12
	Deep Creek	0.87	1, 2, 8	9, 10, 13
	French Creek	0.06	10	18, 20
	Jerry Creek	0.40	1, 2, 7, 8, 10	1, 2, 6, 8, 9, 10, 14, 18
	Moose Creek	5.90	1	9
	Sawlog Creek	0.80	2, 5, 8, 10	10, 12
	Soap Creek	5.00	2, 5, 8	9, 10, 12
	Sevenmile Creek	0.27	2, 8	6, 13
	Wickiup Creek	0.07	2, 5, 8, 9, 10, 11	10, 12, 19
Jefferson River (10020005)	Jefferson River	0.56	1, 2, 4, 8, 10, 11	5, 9, 13, 17, 18
	Big Pipestone Creek	3.26	1, 2, 4, 5, 6	1, 5, 8, 9, 12, 13, 17, 21
	Fish Creek	0.94	1, 2, 8	1, 9, 10, 12, 17, 20
	Fitz Creek	0.88	2, 5, 8	10
	Halfway Creek	0.71	2, 8	5, 10, 12
	Whitetail Creek	2.33	1, 2, 5, 6, 7, 8, 10, 11	6, 9, 17, 18
Boulder River (10020006)	Boulder River	4.20	1, 2, 4, 7, 8, 10	1, 9, 18, 19
	Basin Creek	0.04	2, 8, 9, 10, 11, 14	5, 6, 12, 14, 18
	Big Limber Gulch	1.55	9, 10, 11	18
	Cataract Creek	0.35	6, 7, 8, 9, 10, 11	5, 6, 14, 18
	High Ore Creek	2.12	2, 4, 8, 9, 10, 11, 14	5, 6, 8, 14, 18, 21
	Little Boulder River	0.53	2, 10	1, 8, 18, 19
	Muskrat Creek	2.66	2, 10, 11	6, 18
	NF Little Boulder River	0.11	2, 6, 7, 8	10, 12
	Nursery Creek	0.92	6, 7, 8	12, 14

Table 3-3
Impaired Water Bodies by 4th Level Hydrologic Unit Code 2005 Survey

4th Hydrologic Unit Code	Stream Segment Within BLM Land	Miles Within BLM Land	Probable Impairment Type(s)[A]	Probable Impairment Source(s)[B]
Upper Missouri River (10030101)	Beaver Creek	0.25	2, 6, 7, 8, 10, 11	9, 10, 12
	Clancy Creek	0.70	2, 8, 9, 10, 14	10, 12, 16, 18
	Confederate Gulch	1.47	1, 2, 7, 10	1, 8, 18, 19, 21
	Corbin Creek	0.07	2, 4, 8, 9, 10 11, 14	1, 17, 19
	Crow Creek	1.05	2, 8, 10, 11	18, 19, 21
	Deep Creek	0.18	1, 2, 8	1, 4, 5, 6, 11, 13
	East Fork Indian Creek	1.98	9, 10, 11, 14	18
	Falls Gulch	1.54	9, 10	18, 19
	Golconda Creek	3.09	10, 11	18, 19
	Granite Creek	1.14	10, 14	18
	Indian Creek	4.88	9, 10, 11, 14	18, 19
	Jennies Fork	0.22	5, 6, 7, 8, 11	10, 12, 19
	Little Prickly Pear Cr	2.04	1, 2, 4, 8	1, 5, 10, 12, 14, 17
	Lump Gulch	1.89	9, 10, 11	18
	Missouri River	0.38	1, 2, 5, 6, 7, 8, 10, 11	1, 9, 10, 17, 18
	Prickly Pear Creek	0.86	2, 8, 10, 11, 14	8, 13, 18, 20
	Sevenmile Creek	0.11	1, 2, 5, 7, 8, 10, 11	6, 10, 13, 18, 21
	Silver Creek	0.03	1, 2, 9, 10, 14	1, 9, 18, 19
	Sixteen Mile Creek	1.62	2, 5, 6, 7, 8	10, 21
	Skelly Gulch	0.83	8, 14	12, 18
	Trout Creek	0.33	2, 8	5, 10, 12
	Virginia Creek	1.97	10, 11	18
	Woodsiding Gulch	2.07	5, 7	12
Upper Yellowstone (10070002)	Mill Creek	0.20	1	17
	Suce Creek	0.11	1	17
	Yellowstone River	0.27	2	5, 13
Blackfoot River (17010203)	Blackfoot River	1.90	7, 8, 10	1, 11, 18, 19
Impaired Streams Mileage on BLM Managed Lands		**77.37**		

[A] Cause: 1= flow alterations; 2=habitat alterations (including wetlands); 3=dewatering; 4=thermal modifications; 5=phosphorous; 6=nitrogen; 7=nutrients; 8=sedimentation; 9=mercury; 10=metals; 11=lead; 12=riparian degradation; 13=suspended solids; 14= arsenic

[B] Source: 1=agriculture; 2=construction; 3=land development; 4=habitat modifications (other than construction); 5=removal of riparian vegetation; 6=grazing-related; 7=pasture grazing-riparian construction; 8=highway/road/bridge construction; 9=irrigated crop production; 10=range grazing-riparian; 11=crop-related; 12=logging road construction & maintenance; 13=bank or shoreline modification & destabilization; 14=silviculture; 15=intensive animal feeding operation; 16=confined animal feeding operation (NPS); 17=hydromodification; 18=abandoned mining; 19=resource extraction;20=placer mining; 21=channelization.

The Montana Department of Environmental Quality (DEQ) web site provides an excellent assessment database that allows for queries of specific basins. This includes maps that show water bodies, ownership, TMDL planning areas, and other landmarks. This database can be found at: http://deq.mt.gov/cwaic/default.aspx?yr=2006

The primary beneficial uses of water on public land include agriculture, support of wildlife, and recreation. Water use on private land within the area is primarily for agriculture and domestic activities.

There are four municipal watersheds in the Butte Field Office that have federal surface or subsurface mineral rights. They are the Missouri River Siphon, Tenmile Creek drainage, Big Hole River Intake, and Moulton Reservoir. The Tenmile Creek drainage is Helena's primary source of drinking water. Additional water is obtained, as needed, during the summer months from the Missouri River Siphon which is located on the downstream side of Canyon Ferry Dam. The Big Hole River Intake encompasses a major portion of the Big Hole watershed upstream of the intake and is an important source of drinking water for the city of Butte. Moulton Reservoir is about five miles north of Butte and provides additional drinking water for Butte.

Municipal watersheds provide water to public water supplies which provide drinking water to municipalities. Montana is required under the 1996 amendments to the Federal Safe Drinking Water Act to carry out a Source

Water Assessment Program. The Source Water Assessment Program requires all public water systems to identify and protect their water sources. Each city public works program has local ordinances that regulate surface land use in order to protect public drinking water source(s).

Water quantity is another resource quality indicator based on whether the Proposed Action or alternatives would result in a flow or water level reduction for either surface water or groundwater resources. Criteria evaluated include water rights, beneficial uses, and ecological conditions. The PA includes portions of 15 major watersheds (4th level Hydrologic Unit Code or HUC) in west central Montana. Surface water flow data presented herein were retrieved from the U.S. Geological Survey (USGS) website (USGS 2004). Water quality data from selected surface water monitoring stations, Big Hole River, Jefferson River, Madison River, Missouri River, Yellowstone River, and Silver Bow Creek are included in Appendix E of the AMS. No specific areas of water quality problems are known in the Decision Area or PA other than the impaired water bodies identified on the Section 303(d) List. Some unspecified areas of streams, rivers, and groundwater probably have exceedences of some water quality standards due to natural or anthropomorphic conditions. Erosion and sedimentation to streams is occurring in some unspecified areas (MDEQ 2006).

A list of water rights held by BLM in the PA is found in Appendix F of the AMS. These water rights data, as well as information on basin closures and groundwater control areas, were obtained from the Montana Department of Natural Resources and Conservation (DNRC 2004a). Groundwater wells located in the PA are shown in Appendix G of the AMS. Groundwater wells monitored periodically for depth to water by the Montana Bureau of Mines and Geology (MBMG 2004) are shown on maps contained in Appendix F of the AMS.

The following subsections describe general water resources for each of the 15 major watersheds that comprise the PA (**AMS Figure 2-4**). **AMS Figures 2-5a, 2-5b, and 2-5c** show greater detail for streams, rivers, lakes, and watershed boundaries located in the northern, western, and southern portions of the PA, respectively. BLM lands are generally scattered such that relatively short stream/river reaches flow through BLM lands in most cases.

Big Hole River Basin

The Big Hole River basin is the western-most drainage basin in the southwest portion of the PA (**AMS Figure 2-4**). Only the north-central portion of this watershed is within the PA. Streams and rivers of this area drain south to the Big Hole River.

Major streams in the area that drain to the Big Hole River include West Fork Fishtrap Creek, Seymour Creek, Divide Creek, and Moose Creek.

Currently, the Big Hole River basin is closed to further appropriations and reservations of surface water as part of the Upper Missouri River basin legislative closure. Beneficial water use permits for groundwater can still be obtained.

Jefferson River Basin

The Jefferson River basin is one of the south central watersheds within the PA (**AMS Figure 2-4**). Major streams in the basin that flow into the Jefferson River include Fish Creek, Little Pipestone Creek, Big Pipe stone Creek, Whitetail Creek, Little Whitetail Creek, and the Boulder River. Major lakes or reservoirs within this watershed include Delmoe Lake (Big Pipestone Creek drainage), Willow Creek Reservoir, and Whitetail Reservoir. Whitetail Reservoir is part of the water supply system for the town of Whitehall. The entire Jefferson River basin is closed to further appropriations and reservations of surface water as part of the Jefferson-Madison River basin legislative closure. Beneficial water use permits for groundwater can still be obtained.

A sediment transport study (Berger and Gammons 2004) concluded that approximately 90 percent of sediment entering Pipestone Creek is from overland flow on hillsides and bank erosion. The largest human-caused sediment sources were due to uncontrolled runoff from gullying developed on steep hill slopes along portions of Interstate 90. Relatively minor contribution of sediment to Pipestone Creek was attributed to off-highway vehicle use.

Boulder River Basin

The Boulder River basin is the central-most watershed in the management area (**AMS Figure 2-4**). There are no major lakes or reservoirs in this management area. The Boulder River basin is closed to further appropriations and reservations of surface water as part of the Jefferson-Madison River basin legislative closure. Beneficial water use permits for groundwater can still be obtained.

Madison River Basin

The Madison River basin is one of the south-central watersheds (**AMS Figure 2-4**). Major streams in the basin that flow to the Madison River include: Beaver Creek, Elk Creek, and South Fork of the Madison River. Hebgen Lake is the major lake or reservoir in the planning district.

The entire Madison River basin is closed to further appropriations and reservations of surface water as part of the Jefferson-Madison River basin legislative closure. Beneficial water use permits for groundwater can still be obtained. A controlled groundwater area exists for the basin upstream of Hebgen Lake and was established to regulate groundwater development adjacent to Yellowstone National Park in an effort to preserve its natural hydrothermal features.

Gallatin River Basin

The Gallatin River basin originates from the Yellowstone Plateau and continues north to the confluence with the Missouri River near Three Forks (**AMS Figure 2-4**). Major streams in the watershed include Hyalite Creek, Bridger Creek, Taylor Creek, Hell Roaring Creek, and Dry Creek. Hyalite Reservoir is the only major lake in the basin and is part of the water supply system for the town of Bozeman.

The Gallatin River basin is closed to further appropriations and reservations of surface water as part of the Upper Missouri River basin legislative closure. Beneficial water use permits for groundwater can still be obtained.

Three controlled groundwater areas exist in or near the town of Bozeman and include the Bozeman Solvent Site, Sypes Canyon, and Idaho Pole. The controlled groundwater area adjacent to Yellowstone National Park exists within the headwaters of the Gallatin River.

Upper Missouri River Basin

The Upper Missouri River basin is the largest of the watersheds in the PA (**AMS Figure 2-4**). Major streams in this watershed include Deep Creek, Confederate Gulch, Avalanche Gulch, Trout Creek, Beaver Creek, Little Prickly Pear Creek, Prickly Pear Creek, Ten Mile Creek, and Crow Creek. Major lakes and reservoirs in this management area include Canyon Ferry Reservoir, Hauser Lake, Holter Lake, Lake Helena, and the Helena Valley Regulating Reservoir. These lakes and reservoirs are part of an irrigation and power generation network that constitute dammed portions of the Missouri River. In addition to these major water bodies, Chessman Reservoir and Scott Reservoir are part of the water supply system for the town of Helena. Park Lake is an alpine lake located near the Continental Divide south of Helena and used for recreation.

The Upper Missouri River basin is closed to further appropriations and reservations of surface water as part of the Upper Missouri River basin legislative closure. Beneficial water use permits for groundwater can still be obtained. Currently, the North Hills controlled groundwater area is located in the PA in the northern portion of the Helena Valley.

Upper Missouri-Dearborn River Basin

A small portion of the PA located on the north slope of the Big Belt Mountains east of Holter Lake is within the Upper Missouri-Dearborn River basin (**AMS Figure 2-4**). These land tracts do not directly affect any major surface water bodies.

Upper Musselshell River Basin

A small portion of the Upper Musselshell River basin drains the northeast slope of the Crazy Mountains (**AMS Figure 2-4**). These land tracts do not directly affect any major surface water bodies.

Yellowstone River Headwaters Basin

The Yellowstone River Headwaters basin located upstream of the town of Gardiner drains the Yellowstone Plateau and a portion of the Absaroka Mountains in Gallatin County (**AMS Figure 2-4**). Major streams include Slough Creek, Buffalo Creek, Hellroaring Creek, and the Lamar River.

The headwaters of the Yellowstone River within Montana and within Yellowstone National Park are closed to further appropriations and reservations of surface water. The portion of this basin within Montana located north of Yellowstone National Park is part of the controlled groundwater area.

Upper Yellowstone River Basin

A portion of the Upper Yellowstone River basin is within the PA (**AMS Figure 2-4**). Major streams within this basin include Tom Miner Creek, Big Creek, Mill Creek, Trail Creek, and the Shields River. Daily Lake is the only major lake or reservoir within the basin.

A portion of this basin near the town of Gardiner is part of the Yellowstone National Park controlled groundwater area.

Shields River Basin

The Shields River basin originates from the Crazy Mountains and continues south to its confluence with the Yellowstone River near Livingston (**AMS Figure 2-4**). Major streams of the basin include Potter Creek, Cottonwood Creek, Muddy Creek, Flathead Creek, and Brackett Creek. Cottonwood Reservoir is the only major lake in the basin.

Stillwater River Basin

The Stillwater River basin has a portion of its headwaters within the PA (**AMS Figure 2-4**). There are no major lakes or reservoirs within this watershed. The Stillwater River is a major tributary of the Yellowstone River.

Approximately a third of this basin is part of the Absaroka–Beartooth Wilderness area. The headwaters of this basin near Yellowstone National Park are listed as a controlled groundwater area.

Clark Fork River Basin

Clark Fork River basin drains the portion of the PA from the Continental Divide near Butte northwest to near Georgetown Lake (**AMS Figure 2-4**). Streams draining north to the Clark Fork River include Basin Creek, Blacktail Creek, Browns Gulch, Silver Bow Creek, Mill Creek, Warm Springs Creek, Lost Creek, and Flint Creek.

Silver Lake near Georgetown Lake is the only major lake or reservoir in the PA. Silver Lake is part of the water supply system for Anaconda and Butte. Large ponds, constructed near Warm Springs and Opportunity, are for treatment of surface water impacted by historic mining and smelting activities.

The Clark Fork River basin is closed to further appropriations and reservations of surface water as part of the basin legislative closure. Beneficial water use permits for groundwater can still be obtained. The Butte Field Office administers only 649 acres of public land in the Upper Clark Fork River Basin.

Blackfoot River Basin

Headwaters of the Blackfoot River basin drain the northwest portion of the Butte Planning District near the town of Lincoln (**AMS Figure 2-4**).

Currently the Blackfoot River basin is closed to further appropriations and reservations of surface water as part of the Upper Clark Fork River legislative closure. Beneficial water use permits for groundwater can still be obtained.

Vegetative Communities

Plant communities occurring in the PA include mid-grass prairie on the driest sites (usually in valleys); fescue grasslands on slopes and foothills with higher precipitation; sagebrush, bitterbrush, and mountain mahogany interspersed in grasslands; and Douglas-fir, Rocky Mountain juniper, ponderosa pine, and limber pine communities adjacent to and encroaching into grasslands and shrublands. The cool moist conifer zone, which is composed of Douglas-fir, lodgepole pine, and Engelmann spruce communities, occupies a relatively narrow mid-elevation range in mountains. The highest and coldest elevations are characterized by communities of subalpine fire, lodgepole pine, Engelmann spruce, and whitebark pine. Riparian communities and wetlands occupy the wettest sites along rivers and streams and sites where water is available in plant rooting zones for a substantial part of the growing season.

Processes of Vegetation Change

Disturbances, whether human-caused or naturally occurring, affect plant communities by creating patterns of varying plant species and age classes across the landscape. Changes in plant community composition and structure and function can be relatively sudden, resulting from wildfire, floods, logging, and mining or more subtle, resulting from fire suppression, drought, insects, disease, or aging of dominant species in the canopy overstory.

Past management has contributed substantially to the vegetation condition and status of ecological succession by changing cycles and frequency of fires and susceptibility of forest vegetation to insects and disease. Prior to European settlement in the mid-1800s, American Indians influenced the range of vegetative conditions mostly through their liberal use of fire to improve forage for horses and assist in hunting. Since the mid-1800s, agriculture, timber harvest, mining, livestock grazing, road construction, introduction of exotic species, and fire suppression have been the dominant factors of change that have shaped vegetation patterns in the PA.

Forest Insects and Disease

Reduced fire frequency in the last century has allowed forest stands to become overstocked, with a high proportion of decadent trees that are stressed from competition and recent region-wide droughts. Stress, higher densities of most forest stands, and conifer colonization of open woodlands, meadows, and grasslands and shrublands have rendered many stands susceptible to insect infestation and disease.

Insects that affect the health of trees in the PA include: mountain pine and pine engraver beetles, species that attack the pines; western spruce budworm, a species that attacks Douglas-fir and spruce; and Douglas-fir beetle, a species that attacks Douglas-fir. Mountain pine beetles typically attack the largest, oldest trees in a stand (Despain 1990). These trees are the highest value for timber and the most valuable for cavity nesting wildlife. **AMS Figures 2-6, 2-7, and 2-8** depict changes in environmentally damaged trees by bark beetle infestations over a period of 20 years from 1984 to 2004. The current mountain pine beetle infestation in the planning area is epidemic and began in the year 2000 (Sturdavent 2007). Mountain pine beetle has infested over 15,500 acres of BLM lands, with the majority of infested stands in the Big Hole, Jefferson, and Missouri watersheds. For the past couple years, the planning area has received essentially "normal" amounts of precipitation, and climatologists have suggested that the long-standing drought in western Montana is now over. Although this change has been demonstrated in improved growing conditions for most bark beetle hosts and resultant reductions in beetle populations, long-term drought conditions are not easily overcome (DeNitto 2006). This is evidenced by an increase in both mountain pine beetle and western spruce budworm within BLM lands in the PA from 2005 to 2006 (USDA-FS 2005c and USDA-FS 2006a).

Similar to mountain pine beetle, western spruce budworm are influenced mainly by weather conditions. The recent drought has increased the intensity of infestation, and spruce budworm has defoliated over 91,000 acres BLM lands in the PA since 2000 (USDA-FS 2000). Budworm populations are usually highest and have the most significant effect in forests that are warm and dry, are dense with multiple crown layers, and are of poor vigor (DeNitto 2006). In 2000, only 229 acres of spruce budworm defoliation was recorded on BLM lands in the PA (USDA-FS 2000). Conversely, in 2006 defoliation was recorded on over 50,000 acres, mainly occurring on BLM lands in the Big Hole, Jefferson, and Missouri

watersheds (USDA-FS 2006a). Normally, spruce budworm does not kill trees, but reduces growth and kills tree tops. The more defoliation a tree experiences over a number of years, the higher likelihood of mortality to occur.

Larger Douglas-fir that experience heavy defoliation become stressed and thus are predisposed to be killed by attack from Douglas-fir beetle. Trees that could normally fend off bark beetle attack are weakened and then easily killed (Joy and Hutton 1990).

Douglas-fir beetle has also been slowly increasing across the BLM lands in the PA. Beetle levels are highest in the Jefferson and Missouri watersheds, with levels also currently increasing in the Big Hole due to widespread spruce budworm defoliation (Sturdevant 2007).

Recent attacks by the red turpentine beetle on ponderosa pine have also occurred in the Helena Valley, in the Jefferson watershed.

The most common forest diseases are:

- Dwarf mistletoe, the most serious and widespread disease affecting lodgepole pine in the PA and throughout its range;
- Schweinitzii root rot, in all conifer species;
- Red ring rot, mainly in pines;
- Commandra blister and western gall rust, in the pine species; and
- White pine blister rust, in whitebark pine and limber pine.

With high rates of insect and disease pathology, forest stands become much more prone to high intensity, severe fires that are stand replacing and can alter site characteristics by altering soil structure and nutrient reserves. Oliver and others (1994) report that many forest ecosystems in the northern Rocky Mountains develop naturally high levels of insect infestation and then burn severely at 100-year intervals.

Vegetation Zones

Broad vegetation zones, generally reflecting a temperature and moisture gradient, are addressed in the following section and depicted on **AMS Figures 2-9a, 2-9b and 2-9c.** The acreage of each of the vegetation zones in the PA and Decision Area is shown in **Table 3-4**.

Vegetation in the PA is predominantly grasslands and shrublands, and subalpine conifer forests. Grasslands and shrublands occupy valley floors and lower slopes, while subalpine conifer communities are present at higher elevations in mountains. The smaller areas of transitional vegetation, dry foothills/woodlands, and cool moist conifer forests reflect a relatively steep elevational gradient that results in relatively narrow zones that support vegetation intermediate in ecological requirements of grassland and shrublands and higher elevation conifer forest.

Vegetation on land within the Decision Area reflects the predominance of land managed by BLM to be present at lower elevations. Most land in the Decision Area is grassland (45 percent) and shrubland (7 percent), and conifer forests and woodlands (45 percent). Amounts of agricultural land substantially differ between the Planning and Decision Areas (**Table 3-4**) at seven percent and 0.7 percent, respectively.

Typically, the most productive agricultural land in valleys is private, whereas land managed by BLM is not as amenable to crop production. Land managed by BLM where agricultural land is present is on the recently acquired McMasters and Ward ranches. This agricultural land is currently seeded to agronomic grass species and will be managed in the future as grasslands.

Forest communities on BLM land generally do not include high elevation montane conifer forests (1 percent). The upper elevations of most land in the Decision Area support moist conifer forests, which are important for timber production and wildlife habitat when combined

Table 3-4
Acres and Percent by Vegetation Zones in the Planning and Decision Areas

Vegetation Zone	Acres in PA	% of Acres in PA	Acres in DA	% of Acres in DA
Grassland Zone	2,451,212	34	135,722	45
Shrubland Zone	313,385	4	19,658	7
Dry Foothills/Woodlands	1,091,820	15	114,926	38
Cool Moist Conifer Zone	800,387	11	21,738	7
Subalpine Fir Zone	1,305,766	18	1,796	<1
Wetland/Riparian	171,313	2	1,266	<1
Agriculture	562,017	8	2,186	1
Unvegetated	344,365	5	3,537	1
Water	77,693	1	265	<1
Urban	72,921	1	0	0
Total	**7,190,879**	**100**	**301,094**	**100**

Note: BLM surface ownership has increased to approximately 307,309 acres since release of the Draft RMP/EIS. These additional acres are predominantly grasslands/shrublands with some woodlands.

with drier mid elevation forests and forestlands adjacent to National Forest (USFS) lands.

Encroachment of conifers has been mapped in the northern part of the PA (**AMS Figure 2-10**). Within the Decision Area, most encroachment takes place in grasslands (17 percent) and shrublands (5 percent) with encroachment also occurring in riparian areas. Douglas-fir, Rocky Mountain juniper, and ponderosa pine are species most commonly invading grasslands and shrublands; whereas, Rocky Mountain juniper more commonly encroaches into riparian areas. Conifers have invaded 250,608 acres of grassland in the PA. Approximately 14,445 acres of sagebrush and 49,803 acres of grassland have conifer encroachment in the Decision Area.

Grassland and Shrubland Zone

Grasslands and shrublands are the most productive grazing land in the PA. Grasslands are an important vegetation community as they represent 34 percent of the PA and 45 percent of the Decision Area. Sagebrush is the most dominant shrubland type within the PA. Approximately four percent of the PA is sagebrush while seven percent of the Decision Area is sagebrush habitat. Sagebrush communities are dominated by Wyoming big sage, mountain big sage, rubber rabbitbrush, skunkbush sumac, and greasewood. Wyoming big sage tends to grow within the mid to low elevations on the drier sites, while mountain big sage occurs in upper elevations under moister conditions.

Native grasslands occupy 135,722 acres of the Decision Area on a variety of topographical positions, from level valley floors, to alluvial benches, and foothills, to dry mountain slopes. Grasslands in valleys and lower toe slopes are dominated by cool-season grasses and sedges which include needle-and-thread, western wheatgrass, prairie junegrass and Sandberg's bluegrass. The warmest and driest grasslands also may have warm season species such as blue grama, prairie sandreed, sand dropseed, or red threeawn. Shrubs are minor components of these grasslands.

Grasslands in the PA have floristic components of the Mixed-Grass Prairie of the Great Plains (western wheatgrass, needle-and-thread, blue grama) and the Palouse Prairie of the Pacific Northwest (e.g., bluebunch wheatgrass, Idaho fescue, western needlegrass, and rough fescues). In general, the warmer, dryer sites, often with heavier soils, support grasslands dominated by sod-forming species typical of the northern Great Plains; whereas the higher elevation, cooler grasslands are dominated by bunchgrasses with floristic affinities with the dry regions of eastern Washington.

Typically, sod-forming grasslands east of the Continental Divide historically were subjected to heavy grazing pressure from bison and other native ungulates; whereas bunchgrasses with origins in the Palouse Prairie farther to the West received much lighter grazing pressure from native ungulates. West of the Continental Divide, bison were relatively scarce or absent; consequently, sod-forming grasses have evolved to be more resistant to heavy livestock grazing and trampling than are bunchgrass-dominated communities. Dominant bunchgrasses such as bluebunch wheatgrass, Idaho fescue, and rough fescue are considered "decreasers", meaning that they decline in vigor and distribution with extended periods of heavy grazing by livestock.

Additionally, grasslands composed of sod forming species tend to be more resistant to the invasion and spread of noxious weeds and other invasive species. Bunchgrass communities have areas of unvegetated soil between bunches of grass, which is susceptible to colonization by noxious weeds. Many of the bunchgrass communities in the PA have been infested with noxious weeds including spotted knapweed, leafy spurge, and Dalmatian toadflax.

At the upper elevation contacts of grasslands with forest communities and woodlands, encroachment by conifer species into grasslands is taking place as a result of fire suppression. Prior to effective fire suppression, foothill grasslands were maintained free of invading trees and shrubs by periodic fires. With successful fire suppression over the last century, many grasslands are becoming woodlands or shrublands, with an associated loss of habitat features provided by grasslands (e.g., livestock and wildlife forage, especially on big game winter ranges; and breeding sites for wildlife adapted to grasslands). Additionally, increased tree and shrub growth increases the risk of high severity fires that would alter soil and vegetation characteristics, increasing the risk of invasion by noxious weeds.

Most grass communities are adapted to frequent fire intervals (USDI-BLM 1993, Lehman 1995 and Heyerdayl et al. 2006). Bluebunch wheatgrass and Sandberg's bluegrass, respond well after fire, including stand-replacing fires. Needle-and-thread does not regenerate after summer burns, which kill root crowns. Response of Idaho and rough fescue to fire varies based on plant vigor, amount of residual litter, and season of burn (USDI-BLM 2003a).

In native grasslands, historically frequent fires burned quickly and did not severely heat the soil and remove protective plant cover. With the addition of woody fuels from encroachment of trees and shrubs, the potential for very hot fires that burn duff and litter down to mineral soil has increased. With the exposure of mineral soil, reproduction of conifers is facilitated, which initiates a type conversion, from grassland to woodland, which may not be reversible with practical management. Conifer species require mineral soil for successful seed germination and growth and do not become established as quickly in intact grasslands.

The most extensive shrublands in the PA are dominated by two types (i.e., subspecies) of big sagebrush (i.e., Wyoming big sage and mountain big sage). There are

19,658 acres of shrub-dominated communities in the Decision Area. It is important to distinguish between the two subspecies because they have ecological differences that are relevant to management. These two forms of big sagebrush differ in their moisture requirements, seed germination characteristics, and importance to wildlife (Morris *et al.* 1976; Tisdale and Hironaka 1981). Wyoming big sage grows on drier sites, on shallow soils in the 8 to 12 inch precipitation range. This subspecies in most common on valley floors and lower slopes in the Three Forks-Townsend area and in the vicinity of Butte, eastward through the PA (Morris *et al.* 1976). Wyoming sagebrush is preferred by sage grouse.

Mountain big sage is most common in the Helena and Shields River valleys, above 6,000 feet elevation, where it contacts the forest margin and high elevation fescue grasslands. Mountain big sage tends to more readily reestablish itself after fire and on sites of disturbance (e.g., road cuts, rodent diggings, and abandoned fields) than Wyoming big sage (Morris *et al.* 1976).

Other important shrubs often growing in association with big sagebrush include rubber rabbitbrush, skunkbush sumac, greasewood, spineless horsebrush, low sage, silver sage, bitterbrush, and shrubby cinquefoil. Serviceberry, chokecherry, wild rose, and species of gooseberry and currant are common on sites with elevated moisture such as ravines and cooler slopes. Common understory species include western wheatgrass, Sandberg's bluegrass, Great Basin wildrye, squirreltail, Indian rice grass, and western needlegrass. Forbs are generally abundant in big sagebrush communities.

Big sagebrush communities occur on a variety of slopes, exposures, and soil types. On the driest sites, bluebunch wheatgrasss is the dominant grass, with rough fescue and Idaho fescue becoming more common with increasing moisture. Fringed sage, broom snakeweed, prickly pear cactus, blue grama, and junegrass are usually conspicuous understory species on drier sites. On moister sites, pussytoes, yarrow, chickweed, and buckwheat are common associates (Mueggler and Stewart 1980).

Low sagebrush is one of the driest shrubland types occurring in western Montana (Mueggler and Stewart 1980), usually growing on south and west exposures, on dry, rocky soils. Low sagebrush communities usually do not form extensive landscape-level stands, but are usually part of larger big sagebrush mosaics. Grasses, such as bluebunch wheatgrass, needle-and-thread, and Sandberg bluegrass dominate the undergrowth. Non-native annual grasses, such as cheatgrass and Japanese brome, may also be present. Common herbaceous species include Hood's phlox, blue flax, lupine, and fringed sage.

The fire history of shrublands has not been firmly established, but fire was probably uncommon on drier sites because of sparse fuels, and more frequent, averaging 32 to 70 years on moister sites with greater herbaceous production (USDI-BLM 2003a). Big sagebrush and low sagebrush are sensitive to fire and do not sprout from root crowns following fire (Howard 1999 and McMurray 1986). Amounts of grass and other vegetation to sustain fire is directly related to the amount of moisture available, consequently, drier sites occupied by drought-tolerant Wyoming big sage and low sage tend to have the least frequent fire return interval (100 years or more between fires) (USDI-BLM 2001). Moister mountain big sage communities are more likely to be growing in association with continuous grass and forb species that can carry fire. Fire return intervals in basin big sage and mountain big sage communities tend to be much more frequent, less than 50 years (Johnson 2000).

Non-lethal and mixed severity fires may burn in a mosaic pattern, leaving clumps of live sagebrush. Common sub-dominants in sagebrush communities, rubber rabbit brush, and spineless horsebrush sprout from root crowns following fire. These species tend to reoccupy burned sites more quickly than big sagebrush, but over time become decadent in absences of periodic fire.

Fire return intervals in sagebrush communities are influenced to a large extent by amounts of herbaceous fuel available to carry fire. Livestock grazing has probably influenced fire return intervals especially on sites where little herbaceous biomass has accumulated. Invasion of sites by non-native cheatgrass also has the potential to substantially alter fire cycles. Cheatgrass is extremely flammable causing stands to burn with much greater frequency, as often as every few years. With drastic shortening of fire return intervals, sagebrush can be effectively eliminated and replaced by grassland dominated by cheatgrass, rabbit brush, and fire-resistant forbs, often invasive species. This type of conversion is common in the Great Basin but is not yet prevalent in the Butte PA.

As with grassland habitats, sagebrush communities within the Planning Area are also experiencing an increase in conifer species. Douglas fir and other conifer species most likely encroached into sagebrush and grasslands in the past but surface fires were probably frequent enough to kill many of these trees before they reached fire-resistant size (Heyerdahl et al. 2006). Heyerdal et al. (2006) found that prior to 1855, fires occurred frequently enough in southwest Montana to limit Douglas fir encroachment (establishment) but not so frequently that they eliminated mountain big sagebrush. These fires are also suspected to have burned in a mosaic pattern across the landscape, retaining a seed source for the re-establishment of sagebrush. Johnson et al. (2006) found several studies that reported declines in shrub (including sagebrush) and herbaceous vegetation throughout the Intermountain West as juniper increases in dominance.

Bitterbrush is more common west of the Continental Divide, but it is present in PA, usually as small patches of only a few acres, generally restricted to rather dry, rocky, southern exposures (Mueggler and Stewart 1980). Bitterbrush is palatable to livestock and wildlife, being

especially important on big game winter ranges. Bitterbrush is usually found in association with dry site Douglas-fir, ponderosa pine, bluebunch wheatgrass, Idaho fescue, and rough fescue.

Bitterbrush is more resistant to grazing early and late in the season than during summer. Plants heavily grazed early in the season tend to produce more biomass than plants grazed at moderate intensity late in the growing season. Plants grazed during dormant periods recover much more quickly than plants grazed during the peak of the growing season (McConnell and Smith 1977).

Bitterbrush is generally considered susceptible to fire, often taking 15 to 30 years to recover following moderate to severe fires; however, the potential to sprout after fire is variable depending on fire severity and season, genetic composition, carbohydrate reserves, and age. Bitterbrushes growing in association with plant communities that have relatively frequent fire intervals tend to sprout more frequently than bitterbrush growing on sites where fire has been excluded for long periods (Agee 1994). Low intensity, high frequency fires favor regrowth from sprouting, whereas higher intensity, less frequent fires favor regeneration by seed.

Curlleaf mountain mahogany dominates communities that typically occupy hot, dry rocky and limestone soils or rock outcrops on slopes. It is one of the few species that meet the protein requirements for wintering deer and is heavily favored by bighorn sheep in summer. Wyoming big sagebrush, rubber and green rabbitbrush and juniper are often present in mountain mahogany communities. Bluebunch wheatgrass dominates the undergrowth; needle-and-thread may be present in varying amounts.

Mountain mahogany often forms dense, closed-canopy stands that have little understory or interspecific competition. Where ponderosa pine and Douglas-fir are also present, mountain mahogany may eventually be overshadowed by tall trees and be shaded out (Ross 1999). Typically, seed production is episodic, often producing copious amounts of seed that germinate under the canopy of mature plants but then die from damping off. Mountain mahogany usually germinates and becomes established on bare mineral soil. The increase in cheatgrass and other invasive species has inhibited reproduction of mountain mahogany in some areas of the West. Mountain mahogany is usually killed by fire, even fires of low intensity, and does not resprout (Ross 1999). Closed, mature stands may not have sufficient understory to carry fire, so fire-induced mortality may be confined to edges of stands. Regeneration by seed may occur after fire if the soil is not rapidly colonized by other competitive plants.

Factors other than fire that can cause extensive mortality include attack by sapsuckers and other woodpeckers, which attack intermediate age class trees and girdle the stems (Ross 1999).

Dry Foothills/Woodlands Zone

The zone is a transition area between the dryer Grassland and Shrubland Zone and the Cool Moist Conifer Zone. This zone has historically been characterized by relatively open stands of limber pine, Rocky Mountain juniper, ponderosa pine, and Douglas-fir on rocky, dry slopes. The relative proportions of these species vary depending on site conditions and fire history (Arno 1980), ranging from mixtures of all four species to stands dominated by one or two species. BLM forest inventory compiled in 2005 for the Decision Area clearly shows that the dry forest types continue to mature in a heavily overstocked condition that is unhealthy, declining in productivity, and unsustainable. These forest stands are crowded, averaging 600 to 700 trees per acre with many sampled stands having well over a 1,000 trees per acre. These stocking levels are indicative of a high potential for insect epidemic and/or large-scale disturbance events with severe effects similar to those that occurred recently with the wildfires of 2000. Stands with these high stocking levels are also undergoing bark beetle infestations and the widespread western spruce budworm defoliation now being seen in many areas. The impacts from these past events are expected to be long-term as well, with deforestation occurring on approximately a quarter to a half of severely affected stands.

Conifer species in this zone are not as productive for timber or fiber because the trees are usually slow growing, often have branches and limbs growing in the lower boles, and are more costly to handle when removed for commercial harvest reducing economic returns when compared to timber harvesting in the higher elevation zones. Many of these forested areas produce high volumes of woody materials suitable for biomass or other forest products. This zone is often important for fire wood gathering, Christmas tree cutting, and recreation because it is easily accessible to many urban areas. Dry foothills and woodlands occupy approximately 15 percent of the PA and 38 percent of the BLM land within the Decision Area.

This zone is important seasonal and year-around wildlife habitat, often being part of big game winter range and year-round habitat for species that occupy the higher elevation forest communities in summer and lower elevation grasslands and shrublands. This zone is especially important for wolves and mountain lions, if elk or deer, their primary prey, are present.

Plant communities in this zone tend to be composed of relatively open stands of small, slow-growing trees with understories of bunchgrass. Plant communities in this zone are susceptible to invasion by noxious weeds because forest overstory cover is not sufficiently dense to shade out invasive weeds and the bunchgrass component does not compete well with weeds because of the prevalence of unvegetated areas among the relatively evenly dispersed bunchgrass clumps.

Of the conifers present in this zone, Rocky Mountain juniper appears to have the widest ecological amplitude, growing admixed with ponderosa pine and Douglas-fir at higher elevations and extending into riparian areas along the Jefferson, Madison, Gallatin, and Missouri Rivers. It forms nearly pure stands on some sites in the PA.

Juniper is important to wildlife, being a major source of forage for mule deer in winter. Juniper berries are an important food for small mammals and birds, especially waxwings. This shrubby tree is important nesting habitat for a variety of birds including chipping sparrow, robins, song sparrows, and sharp-shinned hawks (Scher 2002). Fire is a major factor controlling the distribution of woodland conifer species such as Douglas-fir, ponderosa pine, limber pine and juniper. Limber pine, juniper, and smaller conifers are readily killed by low intensity burns because of its dense lower branches with a high volatile oil content and thin bark. Juniper does not sprout after top-kill by fire, with post-fire establishment from seed. Prior to the late 1800s, more frequent fires probably maintained low densities of woodland conifers, often restricting conifers to rocky sites without sufficient fuel to carry fire. Dry Douglas-fir/ponderosa pine stands historically underwent low to moderate severity fires approximately every 5 to 20 years (Fischer and Clayton 1983). Fire maintained these stands open in structure with grass understories. Currently, most of these stands are overstocked with trees and have a closed canopy with little to no grass in the understory.

Limber pine communities grow on some of the driest sites capable of supporting trees, generally on shallow, rocky soils derived from limestone. On the driest sites, bluebunch wheatgrass is a dominant understory species with rough fescue and Idaho fescue becoming dominant with increasing moisture (Pfister *et al.* 1977). Within the DA there are approximately 7,560 acres of limber pine interspersed with Douglas-fir and ponderosa pine.

Limber pine is of low commercial value due to its growth characteristics and wood quality. The foliage of limber pine is largely unpalatable as a browse species for wildlife; however, its large high-energy seeds are an important food for birds and small mammals. Clark's nutcrackers cache seeds from limber pine, which are often found and eaten by bears.

Limber pine is especially susceptible to five-needle pine blister rust. Stands that are infected with this fungal pathogen often experience 75 to 95 percent mortality (Johnson 2001). Although infection by blister rust has not decimated populations of limber pine in the PA, extensive limber pine communities along the Rocky Mountain Front north of Helena are experiencing large-scale mortality.

Young limber pines are susceptible to low-severity fires because of their thin bark and low branches that can rapidly carry ground fire to the crown. Older trees, some more than 500 years old, are more resistant to fire because they develop thick bark and few branches near ground level. Open savannah-like communities of Douglas-fir and ponderosa pine adapted to dry conditions occupy sites at upper elevations of grasslands and shrublands. These open stands are important to wildlife species such as flammulated owls, which utilize large snags for nesting habitat. Ponderosa pine communities are present on 16,600 acres in the Decision Area while dry Douglas-fir communities are present on 90,700 acres. At the interface of the dry conifer and grassland/shrubland communities, Douglas-fir and ponderosa pine are increasing in density and expanding into areas previously dominated by grasses and shrubs. Fire had been a primary factor in shaping the species composition and stand structure (e.g., canopy layers and dominance of trees and shrubs), but fire suppression has allowed conifers to grow into these areas. Approximately 14,500 acres of shrubland and 49,600 acres of grasslands are encroached with conifers in the PA. Increased density and expansion of conifers reduces the density and vigor of sagebrush and grasses through shading and competition for nutrients and water. Common species associated with ponderosa pine and dry site Douglas-fir stands include ninebark, pinegrass, bluebunch wheatgrass, ponderosa pine, elk, sedge, common juniper, skunkbush sumac, bitterbrush, chokecherry, spirea, rough fescue, and mountain snowberry. In the past, frequent low-intensity fires maintained the high cover of grasses and sprouting shrubs, with lower cover of fire-sensitive sagebrush species.

Conifer encroachment into grasslands and shrublands has expanded because of decreased intervals of fire.

This zone is important from a fire management perspective because it is often part of the wildland-urban interface that separates forests with a high-fire potential from urban and residential areas where fires and smoke pose a risk to human health and property. Conifer species in this zone often encroach into grasslands and shrublands tending to exacerbate the threat of wildfire. **Table 3-5** shows size class and density of dry forest types by 4th field HUC within the Decision Area.

Cool, Moist Conifer Zone

The cool, moist conifer zone represents approximately 11 percent (800,387 acres) of the PA and seven percent (21,738 acres) of the Decision Area. Cool moist conifer communities are the most productive timber-producing forest type in the PA. They also are important summer and fall habitat for elk, deer, black bears, small mammals, migratory birds, and woodpeckers. Large Douglas-fir snags in this forest zone are important denning and nesting sites for cavity-nesting birds and mammals.

The majority of this zone is dominated by lodgepole pine and Douglas-fir with lesser amounts of Engelmann spruce and subalpine fir on colder and moister sites, usually at the higher elevations, or extending downslope in cold-air drainages. Douglas-fir occupies the lower

Table 3-5
Size Class and Density of Dry Forest Types in the Decision Area

	Dry Douglas-fir Medium and Large Size Class High Density		Ponderosa Pine Medium and Large Size Class High Density		Ponderosa Pine and Douglas-fir Medium and Large Size Class Low Density		Limber Pine All Sizes and Densities		Ponderosa Pine and Douglas-fir Seedling Sapling and Pole Class All Densities	
Watershed	**Current**	**Historic[1]**	**Current**	**Historic[1]**	**Current**	**Historic[1]**	**Current**	**Historic[1]**	**Current**	**Historic[1]**
Big Hole	13,733	6,690	0	78	5,272	3,010	10	60	890	3,247
Blackfoot	0	86	0	0	368	78	0	0	0	0
Gallatin	400	61	0	0	133	13	0	0	0	0
Jefferson	19,123	4,875	64	39	8,484	3,337	3,199	405	1,066	3,479
Missouri	23,200	5,597	10,773	1,368	17,502	4,692	4,290	338	4,223	6,352
Yellowstone	1,331	248	0	0	800	228	65	0	0	287
Total	**57,787**	**17,557**	**10,837**	**1,485**	**32,559**	**11,358**	**7,564**	**803**	**6,179**	**13,365**

[1] Historic acres were derived from modeling vegetation conditions over a 500-year period using the SIMPPLLE model, run approximately 30 times, to determine "average" historic condition. See **Appendix D** for more details.

elevations of this zone in association with understory shrub and forb dominants including blue huckleberry, heart-leaf arnica, kinnikinick, beargrass, twinflower, and elk sedge (Pfister *et al.* 1977). These forest vegetation types are also maturing with higher stocking densities as indicated by the forest inventory compiled in 2005. Across the Decision Area, these forests have very low percentages of young stands due in part to successful fire protection in the past and limited treatment activities over the last planning cycle. They are also subject to an increasing potential for insect outbreak as they continue to age and overstory canopies continue to close with the ground vegetation continuing to decline. Moist Douglas-fir communities are present on 5,053 acres of the DA. Lodgepole pine thrives following disturbances such as fire, logging, and insect infestation and is relatively short-lived, becoming decadent in absence of periodic replacement regimes that initiate reproduction. Lodgepole pine is present in the PA as nearly pure stands or intermixed with other conifers. Even aged, single-storied stands occur where favorable fire, seed, and climatic conditions have combined to produce large numbers of seedlings at one time. Dwarf mistletoe is a common disease in many lodgepole stands in the DA. Lodgepole pine communities are present on 16,481 acres of the DA.

Lodgepole pine has a broad ecological range, growing in habitats such as frost pockets, soils with high water tables, and soils low in fertility. Typically, lodgepole pine is a seral or pioneer species and is eventually replaced by Douglas-fir or subalpine fir; however, on some sites lodgepole pine may be a climax species, meaning it persists over a long period of time and is not replaced by other tree species. Typical associates of lodgepole pine include pinegrass, elk sedge, beargrass, twinflower, blue huckleberry, and grouse whortleberry (Pfister et al. 1977). Forest communities in this zone are susceptible to severe, stand-replacing wildland fire. Following fire, lodgepole pine often becomes the dominant tree species because of the proportion of serotinous, fire resistant cones found in the PA that can hold high numbers of viable seeds for twenty years or more, which often survive intense crown fire such as those seen in Yellowstone Park in 1988. Lodgepole pine also has a high rate of seedling survival, rapid growth of young trees, early seed production, prolific seed production, and high seed viability (Anderson 2003).

Currently, this zone has a higher density of sub-dominant trees in the understory and higher levels of fuel than with conditions prior to the early 1900s and, consequently trees are stressed and vulnerable to insects and high-severity, stand-replacing fires.

In cool moist Douglas-fir areas high-fuel conditions have developed as a result of fire suppression and insect infestations in this zone. Instead of having mixed intensity fires that occur every 30 to 60 years and are typical of moderate severity fire regimes (Agree 1998), the risk of high-intensity, large scale fire has greatly increased in this zone over most of the PA. High-intensity, stand-replacing fires can adversely affect many resources such as soils, water quality, wildlife, noxious weed invasions, and fisheries, including threatened and endangered species.

Fire management in cool, moist forest types is addressed by Crane and Fisher (1986). They state that protection from unwanted fire is a major fire management consideration in stands where ignition of live and dead fuels could result in severe fire behavior. It may be difficult and impractical to abate the fire hazard and reinitiate normal fire intervals in such stands except in conjunction with timber harvest operations and other mechanical treatments. Fiedler (1996) suggested that prescribed fire in dense stands or those with understory ladder fuels could fatally damage the already stressed overstory trees. Logging and thinning might be appropriate pre-burn treatments before prescribed fire can safely be introduced into dense forests.

Subalpine Fir Zone

Subalpine fir and Engelmann spruce communities occupy the highest, coolest elevations in the PA. Subalpine fir communities are present on 1,796 acres of the Decision Area.

They have minor importance for timber production and grazing, but are important hydrologically and for wildlife habitat. High snow accumulations in this zone provide most of the seasonal runoff in rivers and streams and recharge groundwater aquifers that provide base flow during the driest parts of the summer. Plant communities in this zone are important habitat for pine marten, boreal owl, lynx, wolverine, elk, mule deer, grizzly bear, black bear, blue grouse, Clark's nutcracker, and migratory birds. This community occupies 18 percent (1,305,766 acres) of the PA but only one percent (1,796 acres) of the DA.

Table 3-6 shows size class and density of cool moist and subalpine fir forest types by 4th Field Watershed within the Decision Area. This zone, dominated by subalpine fir, Engelmann spruce, lodgepole pine, and whitebark pine, extends from the cold limits of Douglas-fir upslope to timberline. Above the elevational cold limit of lodgepole pine (9,850 feet) Engelmann spruce and subalpine fir often co-dominate to form extensive forests to the upper limit of tree growth. Spruce and subalpine firs are extremely cold hardy and at timberline both species develop low-growing gnarled growth forms, known as krumholtz. Common understory species in this zone include pinegrass, elk sedge, beargrass, twinflower, blue huckleberry, and grouse whortleberry.

Spruce requires a mineral soil seedbed for successful establishment; subalpine fir is able to establish in duff and litter because of its rapid root growth. Consequently, subalpine fir seedlings usually outnumber spruce/fir stands even where spruce dominates the overstory. Spruce and subalpine firs are very fire sensitive and are generally killed even by low-intensity fires. Typically, forests in this zone experience stand-replacing fires at intervals of about 150 years (Uchytil 1991). Lodgepole pine ecology in this zone is similar to its ecology in the lower moist, cool conifer communities.

Infrequent stand-replacing fires are necessary to maintain whitebark pine in early to mid-seral stands because of the rapid rate of ecological succession (Howard 2002).

Lodgepole pine often forms single-species, even-aged stands following fire. In areas where spruce is abundant and lodgepole pine is scarce before fire, spruce rapidly establishes if adequate numbers of seed trees are present in adjacent unburned areas. If lodgepole pine is present in the preburn community, it usually becomes dominant, overtopping spruce seedlings; however, because spruce seedlings are shade tolerant, they usually survive and eventually become the largest trees in the stand in the absence of fire (Uchytil 1991).

Whitebark pine generally grows on cold, moist sites, often exposed, rocky ridges near timberline. Regeneration is dependent on Clark's nutcrackers, which remove the large seeds and bury the seeds in shallow caches, usually in open areas and burns, for future food. During years of good seed production, Clark's nutcrackers cache more seeds than they consume, with unretrieved seeds germinating to become new trees (Howard 2002).

Whitebark pine communities experience frequent fires as a result of lightning strikes on exposed, windswept ridges; however fires usually do not spread and are low intensity because of discontinuous canopies and sparse understory fuel.

Natural regeneration of whitebark pine is affected by five-needle pine blister rust, fire exclusion, bark beetles, seed predation, and fungal disease, with the greatest threat being posed by blister rust. Seed predators include Clark's nutcrackers, ravens, chipmunks, red squirrels,

Table 3-6
Size Classes and Density of Cool and Moist and Subalpine Fir Forest Types in the Decision Area

Watershed	Cool and Moist Forests Medium and Large Size Classes – High Density		Cool and Moist Forests Medium and Large Size Classes – Low Density		Cool and Moist Forests Seedling, Sapling, and Pole Size Classes – All Densities	
	Current	Historic[1]	Current	Historic[1]	Current	Historic[1]
Big Hole	5,533	2438	1,320	NA	4,335	4,384
Blackfoot	0	46	460	NA	0	0
Gallatin	0	0	0	NA	0	0
Jefferson	1,493	1518	232	NA	610	549
Missouri	6,187	4262	1,153	NA	1,097	1,174
Upper Clark Fork	262	0	0	NA	0	0
Yellowstone	551	158	301	NA	0	0
Total	**14,026**	**8,422**	**3,466**	**NA**	**6,042**	**6,107**

[1] Historic acres were derived from modeling vegetation conditions over a 500 year period using the SIMPPLLE model, run approximately 30 times, to determine "average" historic condition. See **Appendix D** for more details.

pine grosbeaks, grizzly bears, and pocket gophers. Whitebark pine communities are present on less than 30 acres of the Decision Area.

Wetlands and Riparian Communities

A riparian zone is the swath of land adjacent to a river or stream and is the transition area between terrestrial uplands and the stream. The size of the riparian zone will vary depending on the landscape. It may be a small corridor of vegetation immediately adjacent to the stream or a large network of wetlands.

There are 346 miles of rivers and streams with associated riparian vegetation in the Decision Area. Riparian areas and associated wetlands are some of the most important habitats in the PA for providing ecological functions and values. Riparian areas are the green strips bordering springs, streams, and other bodies of water. They include wetlands, stream channels, and vegetation adapted to soil and moisture conditions transitional between uplands and wetlands. These areas support the highest densities and diversity of breeding birds, including bald eagle, great blue heron, Swainson's hawk, waterfowl, red-tailed hawk, owls, and numerous migratory birds. Riparian areas provide crucial habitat for furbearers such as otter, beaver, mink, and muskrat; white-tailed deer; moose; ring-necked pheasant; red fox; and coyote. Riparian and wetland areas are especially important to the livestock industry. Livestock tend to congregate in wetland and riparian areas and utilize the vegetation more intensely than on adjacent upland sites. Riparian areas and wetlands often produce 10 to 15 times the amounts of forage compared to drier upland sites.

Grazing can have substantial effects on vegetation and soils, resulting in decreased vigor and biomass and alteration of species composition and diversity. Improper grazing of riparian areas can affect the streamside environment by changing and reducing riparian vegetation. Channel morphology can be changed through: widening the streambed, making it shallower; alteration of water flows and velocity; and, decreases in water quality. Water quality changes associated with improper grazing include increased water temperatures, nutrients, suspended sediments, and bacterial counts.

One of the most extensive human-caused influences on riparian zones in the western United States has been grazing (Ehrhart and Hansen 1998). Livestock grazing has been implicated in declining reproduction of cottonwood and aspen communities and degradation of water quality in streams supporting cold-water biota. Extensive livestock grazing can result in a decline in the recruitment of woody species, a reduction in understory diversity, increased erosion, changes in the channel morphology and degraded water quality.

The BLM manages grazing in riparian areas through seasonal constraints on cattle numbers and times of access and through fencing and placement of water sources and salt in upslope areas to encourage movement of livestock away from riparian areas.

Riparian areas also are critical for stabilizing streambanks and shading to reduce water temperatures of streams that support trout and other cold water species. Sediment generated from streambank erosion is an important source of water quality impairment.

Roads in the PA often are within or close to riparian areas, which can adversely affect these areas by vegetation removal, dust generation, sediment delivery to streams and associated wetlands, fragmentation, by preventing channel migrations, and by increasing human activities such as camping and OHV use. Historic mining has often included dredging and other techniques that have altered riparian areas and streams. Riparian areas can also be degraded by noxious weed infestations and recreational activities.

Wetlands are regulated under Section 404 of the Clean Water Act as a subset of Waters of the U.S. Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (U.S. Army Corps of Engineers 1987). Wetlands can consist of herbaceous species, shrubs, and trees.

Riparian shrub communities typically are dominated by red-osier dogwood, willows, and water birch. Douglas-fir and juniper colonize the drier margins and terraces of riparian areas in the absence of frequent flooding.

Currently, riparian vegetation conditions in the Decision Area vary from healthy native vegetation to severely impacted stands with the majority of plants being introduced species. In degraded riparian areas, disturbance processes (such as frequent flooding), which create and maintain riparian communities have been altered and fire is infrequent. As a result there are larger numbers of conifers, especially Rocky Mountain juniper, in valley bottoms and aspen, willow, and cottonwoods are decadent and do not reproduce effectively.

Heavy browsing and trampling by livestock and wildlife have stressed localized areas of riparian vegetation and contributed to streambank instability and delivery of sediment to streams. The role of beavers in creating higher water tables by dam construction and regenerating woody species has been eliminated or reduced in many areas.

In some riparian areas, the loss of water storage from beaver dams and/or the loss of riparian vegetation have changed site potentials and vegetation adapted to drier conditions has increased. Consequently, species adapted to drier site conditions have become more prevalent (e.g., Kentucky bluegrass, streambank wheatgrass, silver sagebrush, and shrubby cinquefoil).

BLM has developed a protocol for determining proper functioning condition of riparian areas. This protocol entails field observations of hydrologic, vegetative, and erosional attributes that indicate functional status of riparian communities. Hydrologic attributes include flow regimes, flood frequency, presence of beaver dams, sinuosity, width/depth ratios, gradient, and riparian zone width. Vegetation attributes include composition, age structure, indicator species, root masses, bank cover, vigor, and woody debris recruitment potential. Erosion attributes include floodplain and channel characteristics, point bar cover, lateral stream movement, stability, and water/sediment balance.

Riparian areas are considered functioning properly when they have adequate vegetation and landforms to:

- Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality;
- Filter sediment, capture bedload, and aid floodplain development;
- Improve flood-water retention and groundwater recharge; or
- Develop root masses and stabilize streambanks against cutting action.

Areas are considered functional–at risk when they are functioning properly to some degree but existing soil, water, or vegetation conditions make them susceptible to degradation. Nonfunctioning riparian areas are identified when conditions are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows.

For fire and fuels management projects, BLM has developed a Riparian Management Zone (RMZ) Strategy (USDI-BLM 2003a) for forested and non-forested riparian areas. Boundaries of RMZs around ponds, lakes, and perennial streams in forested habitat generally would be the width of one site-potential tree height (two site-potential tree heights for waters with special status fish species). In non-forested rangeland ecosystems, RMZs extend to the edge of riparian vegetation; extent of seasonally saturated soil; or to the extent of moderately and highly unstable areas; or if trees are present, the width of one site-potential tree height.

Of the 346 miles of riparian vegetation along rivers and streams in the DA, 150 miles (43 percent) are in proper functioning condition, 147 miles (42 percent) are functioning at risk, 40 miles (12 percent) are non-functional, 1 mile (less than one percent) are unknown, and 8 miles are woody draws (2 percent).

Cottonwood

Black cottonwood is a common overstory species in riparian communities along rivers and larger streams with common shrubs including western snowberry, serviceberry, red-osier dogwood, and wild rose.

Cottonwood communities in the PA are most extensive along the Missouri, Gallatin, and Jefferson Rivers, and other perennial streams. Cottonwood communities occupy riparian zones of rivers and streams that have periodic over-bank flooding. Riparian plant communities are "pulse-stabilized" systems maintained in continual ecological transition (disclimax) through the pulse of periodic flooding. Scouring by floodwaters and deposition of water-borne sediment (alluvium) creates optimum habitat for seedlings of cottonwood and willow species. Seeds of these species germinate almost exclusively on recently deposited, fully exposed alluvium.

According to Mahoney and Rood (1993), the following factors are important for cottonwood seedling establishment: 1) peak flows to prepare germination sites; 2) receding flows at the time of seed release to expose new germination sites; 3) gradually declining water table to limit seedling drought stress and promote root growth; 4) adequate summer flows to meet high water demands; and 5) adequate autumn flows to maintain water balance and over-winter survival. A detailed discussion of life history, ecology, and conservation of North American cottonwood forests is presented by Braatne and others (1996), Johnson (1992), and Hansen and Suchomel (1990). Fluvial processes, associated with establishment and maintenance of riparian forests, are discussed by Scott and others (1996).

Black cottonwood is frequently damaged by low-severity fires, with young trees with thinner bark being more susceptible. Following fire, black cottonwood sprouts from stumps, root crowns, and lateral roots (Steinberg 2001). Rate of sprouting is highest when plants are dormant, and in young plants. Sprout survival is highest when the water table is near the surface. Fire can improve regeneration from seed by increasing light penetration and exposing mineral soil. Exposed mineral soil is essential for successful reproduction from seed.

Aspen

Aspen has historically occupied moist sites from the upper margins of grasslands and shrublands, extending well into the higher Cool Moist Conifer Zone. Aspen is intolerant of shade and grows in even-aged, single-storied stands. Aspen is relatively short lived, usually maturing in 60 to 80 years, followed by a rapid decline in vigor with increased susceptibility to disease. As aspen stands mature and decline in growth and vigor, conifers begin to dominate the sites. Without fire, logging, or some other disturbance, aspen does not effectively reproduce (DeByle and Winokur 1985).

Aspen stands are relatively rare in Montana when compared to the other Rocky Mountain States, but where they occur they support a diverse avifauna. Large stands of pure aspen can be found in southwestern Montana, primarily on the Beaverhead-Deerlodge and Gallatin National Forests and in the Beartooth Mountain portion of the Custer National Forest. It is often the only broad

leafed tree within coniferous forests and therefore provides unique foraging substrates for a variety of insectivorous birds. Its suckers, twigs, and bark are used by wintering ungulates, particularly deer, elk, and moose. Snowshoe hares and cottontail rabbits feed on its twigs and buds, while ruffed grouse are highly dependent on aspen buds in winter. Aspen also provides cavities and snags for cavity dependant wildlife.

Aspen trees are in poor condition over most of Montana. Most of the aspen remaining in the state are in the older age classes and are in critical need of regeneration. Older stands are usually less vigorous and least likely to regenerate successfully. Many of these stands are currently being crowded out by competing conifers and aspen and will eventually be lost from the site. In addition, pure and mixed stands in the older age classes are of low vigor and are often heavily infested with pathogens. Effective fire suppression over the past 50 years has permitted competition and disease to reduce clone vigor to levels lower than would be expected under natural conditions. Compounding the situation, fire suppression has drastically reduced fire-induced regeneration in recent years resulting in few young aged stands.

Noxious Weeds

Noxious weeds, designated by state law and county weed boards, are non-native species that invade areas of native vegetation and replace native species. They are aggressive invaders, especially of disturbed soils, and decrease habitat value for wildlife, reduce range productivity for livestock, and increase costs for other land management activities.

Thirteen species of weeds are known to be well established on about 20,000 acres in the Decision Area (**Table 3-7**).

A substantial number of these infestations occur adjacent to roads, power lines, streams, ditches, and canals indicating vehicles and water are primary carriers of weed seed. Weed spread also occurs through direct human contact, wildlife use and livestock use. This includes weed seed and plant parts adhering to human clothes and weed seeds and parts adhering to animal hair and passing through their digestive system. Noxious weeds and non-native, invasive species are spreading rapidly in much of the Decision Area, including the Travel Planning Areas for which site-specific plans are proposed in this RMP.

Noxious weed infestations are causing adverse impacts on native plant communities, hydrological cycles, wildlife habitat, soil and watershed resources, recreation, and aesthetic values. A shift from shrub and bunchgrass vegetation to noxious weeds decreases wildlife forage and species diversity and increases soil erosion.

Any habitat type that has been disturbed or is in poor ecological condition is subject to noxious weed invasion. The lack of a forest overstory and the bunchgrass structure of many native grasslands and shrublands render them susceptible to weed invasion and infestation. Spotted knapweed, Dalmatian toadflax, and leafy spurge are the most widespread and frequent weeds.

Noxious weeds in coniferous forest habitat types (mostly the Dry Foothills and Woodlands Zone) are the same species that have invaded grasslands and shrublands. The density and vigor of noxious weed populations are inversely related to shading and competition from overstory trees, seedlings, and saplings. In forests, noxious weeds are usually found in open forest stands that have low tree densities and cover because of moisture limitation, or other disturbance.

Table 3-7
Acres of Noxious Weeds by 4th Code Watershed in the Decision Area in 2005

Species	4th Code Watershed[1]					
	Big Hole	**Blackfoot**	**Gallatin**	**Jefferson**	**Missouri**	**Yellowstone**
Canada thistle	354		5	140	78	5
Dalmatian toadflax	1,490		5	3,805	1,080	4
Diffuse knapweed				11	12	
Dyers woad						
Field bindweed				8		
Houndstongue	485		5	2,230	787	108
Leafy spurge	23		65	954	1,047	99
Oxeye daisy						
Russian knapweed				1	213	
Spotted knapweed	1,192	20	129	1,528	3,370	72
Sulfur cinquefoil				1		
Whitetop				55	16	
Yellow toadflax	108		5	172	81	22
Total	**3,652**	**20**	**214**	**8,905**	**6,684**	**310**

[1] No data indicates the species has not been observed in the unit, not absence of the species from the unit.

Effects of wildland fire and fire-suppression on the spread and introduction of noxious weeds are concerns because forest canopy cover has been lost in many areas that were formerly shaded. Prior to the fires, shading by conifers inhibited noxious weeds from spreading into areas with unburned overstories. The proliferation of noxious weeds may alter post-fire succession.

The Butte Field Office utilizes the Integrated Weed Management approach for noxious weed control in all the resource programs negatively impacted by weeds and works cooperatively with other federal, state, and county entities in the common goal of noxious weed control.

FISH

The PA contains a variety of stream networks ranging from headwater stream systems to major river systems. The PA also contains ponds, lakes, and reservoirs of varying sizes. Fisheries in the PA include high-quality coldwater fisheries in rivers and streams and warm water fish communities in lakes, reservoirs, and larger river systems.

A general overview of conditions and trends of aquatic resources includes the following:

- Currently, native fish species (such as Yellowstone and westslope cutthroat trout, bull trout and Arctic grayling) that were historically common throughout the PA are either uncommon or have been locally extirpated. The loss of native species is mainly due to competition with non-native species, hybridization with non-native species, loss of habitat and over harvest.
- Special-status species (bull trout, fluvial Arctic grayling, westslope cutthroat trout, Yellowstone cutthroat trout, and northern red belly and fine scale dace hybrid) are located throughout portions of the PA and some require special management direction dictated by interagency Memoranda of Understanding and Conservation Plans.
- Water quantity and water quality have been affected by management activities, which can become cumulative and produce environmental changes across the landscape. These activities include fire and fire management, road development, mineral development, livestock grazing practices, vegetation alteration (timber harvest, forage production), alteration of flow regimes (by placement of dams and diversions), and crop production. Other factors such as noxious weeds, wildfire, and drought have also affected water quantity and quality.
- A large portion of riparian areas in the Decision Area are not in proper functioning condition (approximately 56 percent).
- Boundaries of the Decision Area have changed and land adjustment (disposal or acquisition) may require different land management activities.

The current condition of aquatic resources is reflective of many types of land use activities that have occurred on state, federal, and private land. The PA contains approximately 7,638 river and stream miles and 60,976 acres of lake/reservoirs in the nine primary 4th field HUCs. Approximately 239 miles of perennial rivers and streams are found within the Decision Area (**Table 3-8**). BLM has lands adjacent to lakes and reservoirs in the PA, but does not specifically manage these water bodies.

Table 3-8
Miles of Streams and Rivers and Acres of Lakes and Reservoirs

HUC	Miles in the PA	Miles in the DA	Acres in the PA
Blackfoot	181.8	1.9	302
Big Hole	594.3	57.7	923
Boulder	600.6	37.8	558
Gallatin	1,231.1	0.05	1,098
Jefferson	438.8	30.3	1135
Shields	695.6	0.0	651
Upper Missouri	2,089.5	107.7	46,411
Upper Clark Fork	687.9	0.8	7,965
Yellowstone	1,118.3	3.1	1,933
Total	**7,637.9**	**239.35**	**60,976**

Many variables within a watershed can affect or influence the condition of aquatic resources. These variables include but are not limited to: land use practices, ownership, surface, and groundwater quality and quantity, and riparian habitat condition. **Table 3-9** presents conditions of select activities within the nine primary 4th field HUCs across the PA. Appendix J of the AMS generally describes the watersheds within each 4th field HUC.

Habitat and Stream Condition

Stream conditions vary across the PA because of the natural topography and natural and human-caused influences such as logging, mining, grazing, road construction, wildfire, landslides, drought, excessive precipitation, extreme floods, dam construction, and water diversion. These disturbances affect the morphology of streams at excessive rates (in the case of human caused influences) or may occur as more pulse-based influences associated with flooding.

Various components of fish habitat are functioning at risk or non-functional. It should be noted that stream segments on BLM land are typically short (in most cases, less than a mile), making these segments difficult to manage in trying to achieve or maintain proper functioning condition.

In the revised draft Forest Plan, the Beaverhead-Deerlodge National Forest (USDA-FS 2005a) discussed the range of aquatic habitat conditions that occur on

National Forest land. To a similar extent, these conditions also exist within the Decision Area, as often USFS and BLM land adjoin or are in close proximity to one another.

Upstream impacts from public and private land play a significant role in the stream conditions. New laws and land management techniques have reduced impacts across many of the aquatic systems on National Forest land and some improvement has occurred. In stream and riparian areas that have not recovered, poor habitat conditions continue and are exhibited by reduced pool quantity and quality, undesirable width-to-depth ratios, excessive fine sediment, reduced stream channel stability, lack of woody debris, excessive daily and seasonal temperature changes, dewatering and poor water quality (USDA-FS 2005a).

Fish migration and upstream movement are often limited by natural and human influenced fish passage barriers. **Table 3-9** contains information provided by MFWP (2005) regarding the number of fish barriers by watershed across the PA. This data set showed no fish barriers on BLM land with the exception of a man-made barrier on Muskrat Creek to prevent the upstream movement of brook trout into restored westslope cutthroat trout habitat.

Riparian Condition

The BLM's Riparian-Wetland Initiative for the 1990s established national goals and objectives for managing riparian-wetland resources on BLM land (Quigley *et al.* 1999). Riparian/wetland areas achieve proper functioning condition when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows.

Given the fragmented nature of land in the PA, the BLM-managed stream segments may be in proper functioning condition, however upstream and downstream conditions may be different. Therefore, even though small segments may be in proper functioning condition, they may not have a significant impact on the stream system as a whole. **Table 3-9** contains information regarding the riparian condition of streams within the 4th field HUC within the Decision Area.

Water Quality/Quantity

Water quality and quantity are important for fish populations. Mining, road building, logging, and livestock use have degraded some streams. Irrigation is a major factor influencing water volume of many streams (USDI-BLM 1983). A detailed water quality and quantity discussion regarding 4th field HUCs in the PA is presented in the Water section above.

Fish Species

MFWP manages the native and non-native fish populations in the PA. Records from MFWP (2005) indicate stocking of native and non-native fish began as early as 1923 in the PA. Many different species were stocked with varying frequency and intensity since the stocking program began. Salmonid species that were stocked included westslope and Yellowstone cutthroat trout, rainbow trout and hybrid combinations thereof, brook trout, brown trout, lake trout and bull trout, as well as Chinook and Coho salmon. Arctic grayling were also stocked. Stocking records indicate that fish were stocked in mountain lakes, creeks, streams, small and large rivers (**Table 3-10**).

Endangered, threatened, and sensitive aquatic species are given special consideration if there is concern with population viability, limited distribution, risks to habitat, or other factors that influence management actions in the Decision Area. Five fish species, including bull trout, Yellowstone and westslope cutthroat trout, northern redbelly dace, finescale dace hybrid, and fluvial arctic grayling have special-status in management considerations (**Table 3-10**).

Bull trout occur in the PA in the upper Clark Fork watershed near Anaconda and in the Blackfoot River. There is no BLM-managed land in close proximity to bull trout in the Upper Clark Fork; however, BLM does manage land near the Blackfoot River where bull trout are present.

As **Table 3-10 and Table 3-10a** indicate, many fish species are found across the PA, providing a diverse fishery and ample recreational opportunities to the pub lic. The presence of salmonids and other special-status fish species is an important aquatic resource component that is used by state and federal officials to evaluate stream health, provide recreational opportunities and can be important in cultural and socioeconomic considerations.

Table 3-10 identifies miles of stream occupied by salmonids and special-status fish species as they relate to the 4th field HUC in the PA and Decision Area, respectively. **AMS Figures 2-21a** through **2-21i** show by 4th field HUC, the surveyed locations of westslope cutthroat and Yellowstone cutthroat trout.

Genetic introgression of native species of salmonids (specifically, westslope and Yellowstone cutthroat trout) with introduced or hatchery fish has been evaluated by the MFWP across portions of the PA. Overall, lands in the Decision Area are more closely related to current and historic westslope cutthroat trout habitats than Yellowstone cutthroat trout habitats. Available information for westslope cutthroat trout is summarized in **Table 3-11** and displayed in **AMS Figures 2-22a, 2-22b, and 2-22c**).

Table 3-9
Current Condition and Trend by 4th Field HUC

Watershed Activity	4th Field HUC								
	Blackfoot	**Big Hole**	**Boulder**	**Gallatin**	**Jefferson**	**Shields**	**Upper Missouri**	**Upper Clark Fork**	**Upper Yellowstone**
BLM Managed Acres Within the PA	932	58,983	40,341	872	40,748	223	147,827	649	8,010
Public Land Acreage	81,394	311,434	306,219	504,161	193,720	86,394	785,132	195,625	550,243
Private Land Acreage	45,355	95,108	179,777	518,934	271,468	428,115	1,109,465	325,325	443,811
Total Acres of Watershed Within the PA	126,749	406,542	485,996	1,023,095	465,188	514,509	1,894,597	520,950	994,054
Primary land use e.g. Grazing, Recreational, Agricultural, Wilderness	Grazing/ Recreation	Grazing/ Recreation	Grazing/ Farming	Farming/ Residential Development	Grazing/ Farming	Grazing/ Farming	Grazing/ Farming	Historic Mining/ Grazing/ Farming	Grazing/ Recreation
Special-Status Species[1] Presence in PA	BT, WCT	YCT, AG, WCT	YCT, WCT,	YCT, AG, WCT	WCT	YCT	YCT, WCT	YCT, AG, BT, WCT	YCT
Special-Status Species Presence on Decision Area	WCT	YCT, AG, WCT	WCT	None Present	WCT	None Present	WCT	WCT	None Present
Miles of 303d Listed Streams in the PA	42.6	128.3	180.8	186.1	158.4	119.5	337.3	288.9	125.3
Miles of 303d listed Streams on the Decision Area	None	10.7	11.2	None	None	1.9	21.6	None	0.3
Stream Miles of PFC in Decision Area[2]	NA	41.1	8.9	NA	14.6	NA	52.5	NA	12.3
Stream Miles Functioning at Risk (FAR) in Decision Area	NA	31.4	16.1	NA	16.7	NA	35.8	0.6	0.8
Stream Miles Nonfunctioning (NFU) in Decision Area	NA	1.5	6.6	NA	4.98	NA	21.2	NA	NA
Surveyed Fish Barriers in the PA[3]	1	7	13	16	3	0	65	13	0

[1] Yellowstone cutthroat trout (YCT); westslope cutthroat trout (WCT); bull trout (BT); Arctic grayling (AG).

[2] Proper Functioning Condition data from Butte Field Office BLM, NA indicates no information was available.

[3] From MFWP database.

Table 3-10
Stream Miles of Fish Species of Interest in the PA and Decision Area by 4th Field HUC*

Fish Species	Status[A]	4th Field HUC																	
		Blackfoot		Big Hole		Boulder		Gallatin		Jefferson		Shields		Upper Missouri		Upper Clark Fork		Upper Yellowstone	
		PA	DA	PA	DA	PA	DA	PA	DA	PA	DA	PA	DA	PA	DA	PA	DA	PA	DA
Yellowstone cutthroat trout	1	NA	NA	17.7	6.0	10.7	NA	100.9	NA	NA	NA	408.5	NA	1.0	NA	8.8	NA	466.7	0.32
Arctic grayling	2	NA	NA	66.8	4.34	NA	NA	80.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bull trout	2	57.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	66.2	NA	NA	NA
Westslope cutthroat trout	1	148.0	2.00	62.0	1.96	36.9	2.96	58.6	NA	22.7	1.33	NA	NA	122.6	3.82	213.0	0.82	NA	NA
Brook trout	NA	91.7	1.94	301.7	17.3	244.2	9.42	378.8	NA	111.3	10.5	165.8	NA	513.2	23.7	183.9	NA	210.6	NA
Brown trout	NA	61.7	1.90	53.8	4.34	71.7	4.70	335.3	NA	99.2	3.24	191.9	NA	430.1	14.01	96.0	NA	247.3	0.72
Rainbow trout	NA	3.9	NA	145.2	12.84	149.3	5.23	425.9	NA	96.9	3.06	68.9	NA	540.9	13.61	55.6	NA	306.1	1.06
Golden trout	NA	NA	NA	NA	NA	NA	NA	6.5	NA	NA	NA	NA	NA	NA	NA	9.0	NA	NA	NA
Yellowstone Cutthroat trout X rainbow trout	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.37	NA

Source: Information was obtained from MFWP databases and is pertinent to the streams they have surveyed. There may be other un-surveyed streams in the PA that also contain similar species.
[A] 1= BLM Sensitive; 2 = Federally listed as Threatened
PA = PA; DA = Decision Area

Table 3-10a
Fish Species Occurrence in the Butte Field Office Planning Area

Common Name	Scientific Name	Native or Non-Native	Probable Distribution in the Planning Area	Status
Goldeye	*Hiodon alosoides*	Native	Yellowstone Drainage	None
Shorthead redhorse	*Moxostoma macrolepidotum*	Native	Yellowstone Drainage	None
Largescale sucker	*Catostomus macocheilus*	Native	Clark Fork Drainage	None
White sucker	*Catostomus commersoni*	Native	Missouri River and Yellowstone Drainages	None
Longnose sucker	*Catostomus catostomus*	Native	Clark Fork Drainage	None
Mountain sucker	*Castostomus platyrntnchus*	Native	Missouri River Drainage	None
Bigmouth buffalo	*Ictiobus cyprinellus*	Native	Missouri River Drainage	None
Common carp	*Cyprinus carpio*	Non-native	Missouri River Drainage	None
Goldfish	*Carassius auratus*	Non-native	Missouri River Drainage	None
Utah chub	*Gila atraria*	Non-native	Missouri River Drainage	None
Northern pikeminnow	*Ptychocheilus oregonensis*	Native	Clark Fork Drainage	None
Redside shiner	*Richardsonius balteatus*	Native	Clark Fork Drainage	None
Golden shiner	*Notemigonus crysoleucas*	Non-native	Missouri River Drainage	None
Northern redbelly dace	*Phoxinus eos*	Native	Missouri River Drainage	None
Northern Redbelly X Finescale Dace	*Phoxinus eos x phoxinus neogaeus*	Native	Missouri River Drainage	BLM - Sensitive
Longnose dace	*Rhinichthys cataractae*	Native	Missouri River Drainage	None
Lake chub	*Couesius plumbeus*	Native	Missouri River and Yellowstone Drainages	None
Flathead chub	*Platygobio gracilis*	Native	Missouri River Drainage	None
Fathead Minnow	*Pimephales promelas*	Native	Missouri River Drainage	None
Central mudminnow	*Umbra limi*	Non-native	Clark Fork Drainage	None
Western mosquitofish	*Gambusia affinis*	Non-native	PA-Wide	None
Kokanee salmon	*Onchornchus nerka*	Non-native	Missouri River Drainage	None
Rainbow trout	*Oncorhynchus mykiss*	Non-native	PA-wide	None
Westslope cutthroat trout	*Oncorhynchus clarki lewisi*	Native	PA-wide	BLM -Sensitive
Yellowstone cutthroat trout	*Oncorhynchus clarki bouvieri*	Native to Montana but not all waters on the RA	PA-wide (mountain lakes only)	BLM - Sensitive
Golden trout	*Oncorhynchus aquabonita*	Non-native	High Elevation Lakes	None

Table 3-10a
Fish Species Occurrence in the Butte Field Office Planning Area

Common Name	Scientific Name	Native or Non-Native	Probable Distribution in the Planning Area	Status
Brown trout	*Salmo trutta*	Non-native	PA-wide	None
Brook trout	*Salvelinus fontinalus*	Non-native	PA-wide	None
Bull trout	*Salvelinus confluentus*	Native	Clark Fork and Black Foot Drainages	USFWS - Threatened
Lake trout	*Salvelinus namaycush*	Non-native	Missouri River and Clark Fork Drainages	None
Arctic grayling (fluvial)	*Thymalus arcticis*	Native	Park Lake, Missouri Drainage; Big Hole Drainage; and Heart Lake in the Clark Fork Drainage	BLM - Sensitive
Mountain whitefish	*Prosopium williamsoni*	Native	PA-wide	None
Channel catfish	*Ictalurus punctatus*	Native	Missouri River Drainage	None
Stonecat	*Noturus flavus*	Native	Missouri River Drainage	None
Black bullhead	*Ameiurus melas*	Non-native	Missouri River Drainage	None
Burbot	*Lota lota*	Native	Missouri River Drainage	None
Black crappie	*Pomoxis nigromaculatus*	Non-native	Missouri River Drainage	None
Pumpkinseed	*Lepomis gibbosus*	Non-native	Missouri River and Clark Fork Drainages	None
Bluegill	*Lepomis macrochirus*	Non-native	Missouri River Drainage	None
Smallmouth bass	*Micropterus dolomieu*	Non-native	Missouri River Drainage	None
Largemouth bass	*Micropterus salmoides*	Non-native	Missouri River Drainage	None
Slimy sculpin	*Cottus cognatus*	Native	Clark Fork Drainage	None
Mottled Sculpin	*Cottus bairdi*	Native	Missouri River Drainage	None
Yellow perch	*Perca flavescens*	Non-native	Missouri River and Clark Fork Drainages	None
Walleye	*Sitzaostedion vitreum*	Non-native	Missouri River Drainage	None

[1]Planning Area-wide includes: portions of the Madison, Jefferson, Gallatin, Boulder, Clark Fork, Blackfoot, Big Hole, Missouri River and Yellowstone Rivers.
Source: Montana Department of Fish Wildlife and Parks, 2005.

Table 3-11
Westslope Cutthroat Trout Introgression Within the Planning and Decision Areas

Watershed	Status[1]	Stream Miles	
		PA	Decision Area
Big Hole	1	31.22	1.43
	2	11.84	
	5	2.88	
	6	3.65	
Blackfoot	1	103.45	0.05
	2	10.93	
	5	22.04	
	6	15.99	1.90
Jefferson	1	6.4	
	5	8.17	
	6	6.61	0.14
Boulder	1	28.85	2.96
	2	3.45	
	5	1.61	
Gallatin	1	4.18	
	2	9.22	
	3	23.16	
	6	17.94	
Upper Missouri	1	44.40	0.49
	2	20.06	0.05
	3	6.60	0.47
	4	15.23	0.84
	5	9.83	0.04
	6	30.65	2.08
Upper Clark Fork	1	52.56	
	2	15.83	
	5	36.26	0.83
	6	108.3	

[1]Status: 1 = Unaltered; 2 = < 10% Introgression;
3 = 10 – 25% Introgression 4 = > 25% Introgression
5 = Suspected Unaltered; 6 = Potentially Altered

Restoration

MFWP, BLM, and the USFS collaborate in an ongoing effort to conserve westslope cutthroat trout in Muskrat Creek, a tributary to the Boulder River. The relatively high quality aquatic and riparian conditions as well as the remnant westslope cutthroat trout population provide an excellent opportunity for westslope cutthroat trout restoration in this stream. A wooden barrier was constructed near the USFS boundary at river mile 7.6 in 1997. Since that time, brook trout have been annually removed (using electrofishing) upstream of the barrier to a natural barrier at river mile nine, above which the brook trout do not occur.

In 1997, native westslope cutthroat trout were also relocated above the natural barrier (formerly a fishless section of stream). The westslope cutthroat trout relocated above the natural barrier survived and reproduced in the upper basin and by 2002 the trout had expanded upstream to the headwaters (approximately river mile 13.5) as well as downstream throughout the stream. Removal of brook trout between the man-made barrier and natural barrier has been successful. In the summer of 2003, only 18 brook trout were found in July and no brook trout were captured during an extensive effort of four electrofishing passes in October. All the brook trout captured during July 2003 were age 2 and older fish confirming that no brook trout were successfully recruited to the population during the past three years. No brook trout were captured during 2004 or 2005 and approximately 5.9 miles of Muskrat Creek is once again considered to have a restored and protected population of westslope cutthroat trout. MFWP now uses this stream as a donor source of fish to re-establish westslope cutthroat trout populations in other streams within and beyond the PA boundaries.

WILDLIFE

Important wildlife habitats include wetlands and riparian areas, coniferous forests, shrublands, grasslands, snags (standing dead trees), cliffs and rocky outcrops, and caves and abandoned mines. Seasonally important habitats include big game winter ranges, calving and fawning areas, raptor nest sites, bat breeding and hibernation sites, waterfowl nesting areas, sage grouse and sharptail grouse courtship (leks) and nesting areas, wolf denning and rendezvous sites, and grizzly bear habitat. The PA is

an important wildlife linkage area that connects the Yellowstone Ecosystem, the Continental Divide, the Gravelly Mountains, the Tobacco Root Mountains, the Belt Mountains, and the Northern Continental Divide Ecosystem allowing the potential for movement and genetic exchange among geographically dispersed wildlife populations. The extents of the various habitats are shown in **Table 3-4**.

Populations and distribution of wildlife in the PA have been influenced by past management activities that have altered habitat or caused disturbance including agricultural activities (including livestock grazing), mining, timber management, exclusion of fire (colonization by conifers into grasslands and shrublands), recreation, urban and suburban expansion, highway and road construction.

While the BLM manages habitat for a variety of wildlife species, it is the MFWP that has responsibility to manage wildlife populations.

Habitats

Grassland/Shrubland

Sagebrush grasslands are critical areas for a variety of wildlife species as they provide critical winter range for game species and there are many species that are sagebrush obligates.

Grassland and shrubland communities have been identified to be dominant communities within the winter ranges of antelope, elk, mule deer, moose, and bighorn sheep within the PA. Sagebrush is one of the only shrubs that have levels of crude protein high enough to sustain large herbivores throughout the winter. Other shrublands that occur within the PA include low sagebrush, bitterbrush, and mountain mahogany.

Both grassland and shrublands provide habitat for a variety of wildlife species by providing forage, cover, and water. Species that utilize these habitats include: mule deer, elk, pronghorn antelope, coyote, red fox, badger, jackrabbit, pygmy rabbit, black-tailed prairie dog, sage grouse, ferruginous hawk, Swainson's hawk, mountain plover, sage thrasher, sage sparrow, Brewer's sparrow, long-billed curlew, northern harrier, prairie falcon, Baird's sparrow, chestnut-collared long spur, loggerhead shrike, marbled godwit, McCown's longspur, Sprague's pipit, western rattlesnake, and Columbian, Wyoming, and Richardson's ground squirrels.

There are a variety of factors that reduce the quality and availability of grassland and shrubland communities in the PA. Fire suppression has probably had the greatest influence within these communities, as changes in fire regimes have resulted in encroachment of conifers into grassland and shrubland communities; thereby reducing the grassland/shrubland habitat (Heyerdahl et al. 2006). The introduction of noxious weeds has also resulted in a loss in grassland habitats in some areas. In addition, grazing can degrade and influence grassland/shrubland habitats when stocking rates are at levels that cause a decline in rangeland health.

Dry Foothills / Woodlands

Open savannah-like communities of Douglas-fir and ponderosa pine adapted to dry conditions occupy sites at upper elevations of grasslands and shrublands. These communities are important to wildlife species such as flammulated owls, which utilize large snags for nesting habitat. Large ponderosa pine and Douglas-fir snags occur in low densities but persist on the landscape for long periods and provide a critical habitat component. While conifer encroachment into grasslands and shrublands is resulting in a loss of these habitats, areas of conifer encroachment provide habitat for a wide variety of birds, small mammals, and big game animals. Woodlands have been identified as important communities within winter range for elk, moose, mule deer, bighorn sheep, and white-tailed deer. Mountain mahogany communities can be particularly important in some areas by providing winter range for big game animals. These areas can also be critical for providing transitional habitat between winter and summer range and travel corridors for wildlife.

Some of the species that can be found in these communities include: mule deer, white tailed deer, big horn sheep, elk, and moose and coyote, bobcat, mountain lion, black bear, yellow-pine chipmunk, red squirrel, striped skunk, sharp-shinned hawk, Cooper's hawk, blue grouse, hairy and downy woodpeckers, chickadees, mourning dove, finches, evening grosbeak, jays, Clark's nutcracker, nuthatches, spotted towhee, dark-eyed junco, mountain bluebird, Williamson's sapsucker, northern flicker, common nighthawk, olive-sided flycatcher, dusky flycatcher, golden-crowned kinglet, Swainson's thrush, hermit thrush, Townsend's solitaire, solitary vireo, western tanager, Cassin's finch, pine siskin, western small-footed myotis, long-eared myotis, silver-haired bat and hoary bat.

Cool, Moist Conifer Zone

Cool, moist coniferous forest stands within the PA provide habitat for a variety of wildlife species. Some of these species include: elk, moose, deer, black bear, grizzly bear, lynx, mountain lion, wolverine, fisher, marten, goshawk, coopers hawk, sharp-shinned hawk, boreal owl, three-toed woodpecker, black-backed woodpecker, hairy woodpecker, Williamson's sapsucker, northern flicker, and hermit thrush. This community can also be very important for providing winter range for big game species such as elk, moose, and white-tailed deer.

Snags and down wood are major wildlife habitat components of the ecosystem. Their natural abundance and distribution have been altered by decades of land conversion, fire suppression, timber and firewood harvest, and mining activities. Standing snags provide foraging, roosting, denning, and nesting habitat for a number of wildlife. A variety of cavity nesters and forest mammals

rely on the presence of large diameter snags for reproduction and protection. In addition, there are several sensitive species that are dependent on old growth habitat and the downed woody material that is found within these stands. Maintaining a diversity size and age classes is very beneficial for forest wildlife species.

As snags decay and fall to the ground, they become down wood and provide food and shelter for different species. Down wood also stores nutrients and moisture, and aids in soil development.

Subalpine Fir

Snags occur in pulses of high density subalpine fir, spruce, lodgepole pine, and occasionally Douglas-fir, that historically persisted for short periods of time (5-25 years). Snags can occur over extensive areas (10's to 1,000's) of acres. Large, unfragmented patches of burned or insect killed stands are critical for species that depend on this type of habitat such as black-backed and three-toed woodpeckers, and the Canada lynx that requires large areas of young subalpine and lodgepole pine forest for foraging.

The wildlife species that utilize these habitats are many of the same species that are found in the cool, moist conifer habitat. Some of these species include: elk, deer, moose, lynx, wolverine, grizzly bear, black bear, pine marten, boreal owl, blue grouse, Clark's nutcracker, and a variety of migratory birds. These communities are not as susceptible to the impacts of fire suppression and timber management.

Wetland/Riparian

Riparian areas are important because they generally have better quality soils than the surrounding hillslopes and, because of their position lower in the landscape, often retain moisture over a longer period. Riparian areas support a higher diversity of plants and animals than non-riparian land. This is a result of the wider range of habitats and food types present as well as the proximity to water, microclimate, and refuge. Many native plants are found only, or primarily, in riparian areas, and these areas are essential to many animals for all or part of their lifecycle. Riparian land also provides a refuge for native plants and animals in times of stress, such as drought or fire, and plays a large role in providing corridors for wildlife movement.

Although riparian zones may occupy a relatively narrow band, they are critical to maintaining the biodiversity of the more extensive, adjoining uplands. For example, over 75 percent of the animal species in arid regions need riparian habitats at some stage of their life cycles. A variety of wildlife species utilize wetland/riparian habitats. Some of these species include: white-tailed deer, moose, bobcat, beaver, otter, mink, coyote, and a variety of small mammals such as skunks, shrews, mice, weasels, and voles as well as numerous bat species. Lynx are known to use riparian areas as dispersal corridors and for hunting snowshoe hare. Wetland/riparian habitats support the highest densities and diversity of breeding birds such as: bald eagle, Swainson's hawk, red-tailed hawk, owls, great blue heron, flycatchers, woodpeckers, belted kingfisher, spotted sandpiper, western wood-peewee, white-crowned sparrow, yellow warbler, song sparrow, other warblers, and a variety of migratory birds.

Rivers, streams, ponds, and wetlands provide important habitat for migrating waterfowl such as redheads, pintails, goldeneye, bufflehead, Canada geese, and snow geese. These habitats also provide habitat for breeding waterfowl including common merganser, wood duck, ruddy duck, lesser scaup, cinnamon teal, blue-winged teal, green-winged teal, northern shoveler, American widgeon and gadwall. Although habitat for waterfowl is found throughout the Planning Area, these habitat types are limited in the Decision Area.

Aspen

Aspen stands are relatively rare in Montana when compared to the other Rocky Mountain States, but where they occur they support a diverse avifauna. It is often the only broadleafed tree within coniferous forests and therefore provides unique foraging substrates for a variety of insectivorous birds. Its suckers, twigs, and bark are used by wintering ungulates, particularly deer, elk, and moose. Snowshoe hare and cottontail rabbit feed on its twigs and buds, while ruffed grouse are highly dependent on aspen buds in winter. Aspen also provides cavities and snags for cavity dependant wildlife.

Producing profuse suckering from aspen regeneration practices does not ensure the reestablishment of new aspen stands. Suckers are highly palatable to some wildlife, such as elk and moose, and entire stands of young aspen can be lost to browsing. In addition, young aspen are quite fragile and susceptible to physical damage caused by trampling from hoofed animals, including livestock. For these reasons, efforts to reestablish aspen in small localized areas often fail. Isolated pockets of young aspen tend to draw elk, moose, and deer to these areas resulting in unacceptable levels of browsing. Similarly, efforts to reestablish aspen in areas of heavy livestock use often result in excessive damage to young trees.

Insect and Disease

Dwarf mistletoe provides a source of vertical and horizontal diversity through gap creation, and production of snags, brooms and down woody material. Many species of mammals, birds, and arthropods can take advantage of the favorable structure mistletoe infection provides, while other species use mistletoe plants or host tissues associated with infection for food.

The abundance of dwarf mistletoe is directly correlated with species diversity and bird density (Bennetts 1991). There is also a strong positive relationship between the occurrence of dwarf mistletoe in an area and the number

of snags used by cavity-nesting birds (Bennetts 1991). Witches' brooms are commonly used for nest sites, roosting sites, and cover by a number of bird species. The large mistletoe brooms on Douglas-fir are often used as nesting platforms by several owls, accipiters (including the coopers hawk, goshawk, and sharp-shinned hawk) and passerines. Brooms are also used for roosting cover by grouse. The plant itself is also a food source for some birds (notably Douglas-fir dwarf mistletoe for blue grouse), mule deer, elk, squirrels, chipmunks, and porcupine.

Wildlife Corridors

Wildlife travel corridors are a vital component of habitat for a variety of species. Corridors are travel routes used by wildlife to allow them to disperse to new core areas. Corridors allow for seasonal movements between summer and winter ranges for species such as elk and deer. Corridors are also important for movement of young animals dispersing from their place of birth to establish new territories and home ranges. This can be critical for territorial species such as mountain lion or grizzly bear. A corridor may also be used for daily movements from loafing to foraging areas.

Habitat fragmentation and isolation of populations as a result of degradation or elimination of corridors can result in small, vulnerable populations. Isolated populations are more vulnerable to stochastic events and can be negatively impacted by inbreeding depression. The primary causes for habitat fragmentation are activities related to development such as road building, recreational activities, and residential and commercial developments. Fragmentation of habitat is a concern within the PA as 49 percent of the PA is privately owned and has the potential to be developed. However, 85 percent of Decision Area lands are contiguous with other public lands (**AMS Figure 2-14**). The majority of this land is contiguous with National Forest System land and 75 percent of the blocks of BLM land that are contiguous with other public lands are larger than 1,280 acres. These larger areas that are connected to other public lands provide an opportunity for management of wildlife corridors and core habitat.

Factors that are considered in evaluating corridors include: topography, habitat quality, road density, riparian presence, human developments and activities, vegetative cover and land ownership patterns. It is important to identify wildlife corridors and manage to protect and maintain food, cover, and security and minimize mortality factors.

The Interagency Grizzly Bear Committee (IGBC) identified approaches to managing wildlife linkage areas on public land (IGBC 2004). Some of their recommendations for management include:

- Maintain appropriate amounts and distribution of natural foods and hiding cover in linkage zones to meet the subsistence and movement needs of target wildlife species.
- Avoid constructing new recreation facilities or expanding existing facilities within linkage zones.
- Avoid other (non-recreational) new site development or expansions that are not compatible with subsistence and movement needs of target species in linkage zones.
- Pursue mitigating, moving, and/or reclaiming developments and disturbed sites that conflict with the objective of providing wildlife linkage.
- Manage dispersed recreational use to maintain suitability of approach areas for identified target species. Avoid issuing new permits or additional use days for recreational activities that may conflict with wildlife linkage objectives.
- Manage roads and trails in linkage zones to facilitate target species movement and limit mortality risk, displacement, and disturbance.
- Manage livestock grazing to maintain wildlife forage and hiding cover and to minimize disturbance, displacement, and mortality of target wildlife species.
- Work with adjacent landowners, planners, and other interested parties to improve linkage opportunities across multiple jurisdictions.
- Manage human, pet and livestock foods, garbage, and other potential wildlife attractants to minimize the risk of conflicts between people and wildlife.

Considerable research has been conducted on wildlife corridors within the Northern Rocky Mountain Region. Walker and Craighead (1997) identified potential corridors within Montana using GIS and 'umbrella' species. The 'umbrella' species they selected included grizzly bear, elk and mountain lion. They identified corridors that had the highest likelihood of successful transfer between the Greater Yellowstone Ecosystem and the Northern Continental Divide Ecosystem and many of these corridors occur within the PA. The corridors identified for grizzly bear occur in the Gallatin, Bridger, and Big Belt mountain ranges. Secondary corridors occur in the Taylor-Hilgard, Gravelly, Tobacco Root, Whitetail/O'Neil, and Boulder mountain ranges. Corridors for elk were identified to occur in the north end of the Absaroka, Bridger, and Big Belt ranges, while corridors for mountain lions occur in the Bridger and Big Belt mountains.

Craighead *et al.* (2002) modeled wildlife corridors within the Northern Rocky Mountain Region, delineated core and sub-core habitat areas, and described corridors based on their habitat quality. The model relies on a series of assumptions. One of the critical assumptions is that migrating animals would select the least-cost path or optimum path for travel and that these paths would be

Table 3-12
Corridor Quality in the Planning and Decision Areas

Corridor Quality	Acres of Corridors in PA		Acres of Corridors in DA	
	Acres	% of PA	Acres	% of Decision Area
Core/Sub-core Areas	3,400,418	47	70,019	23
Highest Quality Corridors	223,139	3	22,533	7
Moderate Quality Corridors	534,990	8	61,971	20
Lowest Quality Corridors	838,933	12	45,564	15

those areas in which the animal would encounter fewer hazards, spend less time traveling, and travel through habitat with a higher probability of containing food and concealment, thus increasing the chance for survival. Corridors were developed based on the habitat needs of grizzly bear. Core areas were described as areas large enough for wildlife to forage and reproduce, while sub-core areas were areas that could act as stepping stones for wildlife as they move through the region. Corridors were described as areas of predicted movement between core and sub-core areas, where habitat quality is high, but not as high and contiguous as the core and sub-core areas. Based on this model, 70 percent of the PA is core, sub-core or corridor habitat, with 65 percent of the Decision Area in core, sub-core or corridor habitat. **Table 3-12** and **AMS Figure 2-15** display the acreages for core areas and corridors within the PA and BLM land within the PA.

Within the PA, almost half of the land represents core or sub-core habitat. Of the corridor habitat within the PA, the majority of the corridors are either moderate or low quality. The high quality corridors are located west of Anaconda along the Anaconda Mountains and along Elk Park Pass between Butte and Boulder.

Big Game Animals

Nine species of big game animals occur within the PA. These species are elk, mule deer, white-tailed deer, moose, pronghorn antelope, bighorn sheep, mountain goat, mountain lion, and black bear. Much of the information presented below was based on reports developed by the MFWP. The PA falls entirely within Region 3 of the MFWP regional structure.

Habitat improvement projects occur on both private and public land within the PA. Prescribed burning, riparian restoration, thinning, reduction of conifer encroachment in grasslands and meadows, noxious weed control, riparian restoration, water development, and improved livestock grazing management are all management practices that have been implemented and improve big game habitat. The BLM also coordinates with private landowners, the USFS, and other management agencies to develop and implement habitat improvement projects.

Elk

Elk are generalists exhibiting a wide habitat tolerance. They are distributed throughout the PA and western Montana, but are most commonly associated with mountain ranges (Foresman 2001; MFWP 2003; Skovlin 1983). They utilize the majority of vegetation types found within the PA and are adapted to habitat in transitional areas as there is a negative correlation between levels of use and the distance from the interface between forest and nonforest communities (Skovlin 1983). This relationship is assumed to be due to elk dependence on security cover and the diversity of forage available in transitional areas.

Elk are both grazers and browsers. Their forage preferences vary among seasons and years, and are strongly related to forage availability (Nelson and Leege 1983). Elk migrate seasonally between winter and summer ranges with snow accumulation being the significant factor influencing migration. Wintering grounds are commonly located within foothill areas with south-southwest exposures and windblown ridges. Grassland and shrublands are typically used as winter range. Available winter range is commonly the limiting factor for elk populations; therefore, proper management of identified winter range is important for maintaining stable elk populations.

Approximately 30 percent (2,084,670 acres) of the PA is designated elk winter range, with approximately 188,000 acres of that being managed by the BLM (**AMS Figure 2-16**) (MFWP 1999a). Elk winter range within the PA occurs in predominately woodland and grassland/shrub communities. The PA also contains mapped calving and migration areas; however, the BLM manages only a small portion of this land.

Within the PA, there are approximately 10 Elk Management Units (EMU) as designated by the MFWP (MFWP 2004b). Elk populations within the majority of the EMU's have been either stable or increasing over the last 20 years. This is thought to primarily be a result of changes in hunting regulations from season-long, either sex seasons to antlered bull regulations and limited antlerless permits (MFWP 2004b). Additional factors influencing elk populations within the PA include the recent mild winters, which have resulted in less winter kill, reduced harvesting, and changes in land ownership. Within certain EMUs, land ownership has shifted from traditional landowners that allowed public access for hunting to non-traditional landowners that restrict hunting on their private property, thereby creating refuges for big game. The shift in land ownership and management

has been significant within some EMU's and has impacted harvest success and survey accuracy.

Livestock grazing, timber management and recreation are the most predominant uses of lands within the Decision Area and all of these activities can impact elk habitat. Approximately 80 percent of the Decision Area is managed for livestock grazing. Elk and cattle do have dietary overlap and can compete for forage, which can become critical on winter range. Cattle and elk do not typically utilize the same areas during the winter season as livestock are usually concentrated on private land. However, livestock grazing management has a significant impact on elk winter range as it influences the amount of residual forage that is available for elk.

The Decision Area provides recreational opportunities for the public as this area receives some of the highest levels of hunting on public land and the highest level of bull elk harvest (MFWP 2004b). Recreational activities, especially high levels of OHV use, can degrade elk habitat and cause disturbance to elk. Snowmobile recreation areas, when located within elk winter range, can deter elk from using those disturbed areas and can result in displacement. Roads can also have a significant impact on the quality of elk habitat. Winter range in the Decision Area is broken into 11 areas (**Table 3-13**) for analysis of big game winter range. Within each analysis area, the moving windows analysis was used to calculate open road density within winter range.

Within the Decision Area, the analysis areas with the lowest road densities (less than 1 mile per square mile) in elk winter range are the Big Hole (56 percent), Elkhorns (53 percent), Highlands (56 percent), Missouri (83 percent), Upper Missouri (64 percent), and Yellowstone (7 percent). The Missouri analysis area provides a large amount of elk winter range on BLM lands and also provides the highest quality habitat. Analysis areas with the highest road densities (greater than 2 miles per square mile) in elk winter range are the Blackfoot (72 percent), Clancy (66 percent), and Granite Butte (67 percent).

Timber management is a common resource use in elk summer range within the PA. Timber harvest can have both positive and negative impacts on elk habitat. Timber harvest can improve elk habitat in many areas as it improves the cover to forage ratio. Ideally, cover to forage ratio should not fall below 60:40. The disturbance associated with the implementation of timber harvest can result in the temporary displacement of elk. In addition, the loss of security habitat and an increase in road density can have a negative effect on elk. Elk security measures are the inherent protection allowing elk to remain in an area despite increases in stress or disturbance associated with hunting season or other human activities. Security habitat areas are forested habitats with trees larger than 8 inches DBH, greater than 30 percent density and larger than 250 acres, nonlinear, at least 0.5 mile from an open road, and occupying at least 30 percent of the area used during autumn. **Table 3-14** shows the total acres of security habitat by watershed in the Planning and Decision Areas.

Table 3-14
Acres of Elk Security Habitat by Watershed

Watershed	Total Security Habitat Acres	BLM Security Habitat Acres
Big Hole	63,016	5,808
Blackfoot	19,468	0
Gallatin	30,401	301
Jefferson	72,722	2,965
Upper Clark Fork	48,251	0
Upper Missouri	205,000	9,395
Upper Yellowstone	557,823	405

Table 3-13
Total Road Density for the Decision Area in BLM Elk Winter Range by Big Game Analysis Area

Elk Winter Range Analysis Unit	Total Acres	Total Winter Range	Winter Range on BLM	BLM Acres				
				0 mi/mi^2	Low Density 0-1 mi/mi^2	Moderate Density 1- 2 mi/mi^2	High Density 2 -3 mi/mi^2	Very High Density >3 mi/mi^2
Big Belts	290,949	138,825	6,688	650	1,545	2,207	1,280	1,006
Big Hole	336,143	130,712	23,015	5,257	7,701	4,503	2,330	3,224
Blackfoot	127,398	55,705	445	0	49	76	50	270
Clancy	150,854	110,911	10,879	375	1,173	2,159	2,220	4,952
Elkhorns	641,976	140,437	28,080	4,149	10,816	8,515	3,033	1,567
Granite Butte	192,583	141,729	17,699	158	1,775	3,886	5,121	6,759
Highlands	84,049	57,933	26,407	6,125	8,746	6,204	3,630	1,702
Jefferson	834,418	208,531	33,378	5,706	7,353	7,002	6,003	7,314
Missouri	223,957	140,820	24,031	17,102	2,853	1,409	1,573	1,094
Upper Missouri	327,784	120,992	6,481	2,551	1,565	1,437	822	106
Yellowstone	731,613	159,748	3,252	1,583	787	660	222	0

Mule Deer

Mule deer are distributed throughout Montana and are found in open forested regions, plains, and prairies. They commonly inhabit foothill, coulee, or riparian areas within a grassland or shrubland habitat type. Mule deer can also be found in alpine, subalpine, montane, and foothill zones (Foresman 2001; Mackie *et al.* 1998). In seasonally harsh environments, like western and central Montana, mule deer tend to migrate between seasonal ranges (Mackie *et al.* 1998). Winter range is associated with areas accumulating minimal amounts of snow and tends to occur at low elevation, south and west facing slopes, and wind-blown ridges. Winter range is particularly important for maintaining healthy mule deer populations because the lack of high quality forage, cold temperatures, and increased energy demand associated with the winter season tends to limit and stress populations.

Mule deer will tend to browse year-round favoring species such as bitterbrush, mountain mahogany, sagebrush, and deciduous shrubs. Forbs and herbaceous plants become an important part of their diet in late spring and summer, while shrubs are critical in the fall and winter.

Mule deer are distributed throughout the PA. Approximately 95 percent of the PA represents mule deer habitat. Thirty-four percent (2,445,000 acres) of the PA is year-round/winter range for mule deer with 206,800 acres (8 percent) of that being located on BLM land (**AMS Figure 2-17**) (MFWP 1999a). The majority of the mule deer year-round/winter range within the PA occurs in grassland/shrubland and woodland communities.

The last MFWP published report discussing the status of mule deer in Region 3 was completed in 2002 (MFWP 2002d). This report stated that the mule deer populations within Region 3 were relatively stable and static from 1996 to 2001. The report also stated that recruitment was improving within populations and it was expected that populations would tend to be on the increase.

White-Tailed Deer

White-tailed deer occur throughout Montana and are adapted to a variety of habitats (Foresman 2001). They are common along river bottoms and adjacent uplands in the PA. Habitat disturbance resulting from agriculture and logging have been beneficial to white-tailed deer and has facilitated range expansion (Smith 1991).

White-tailed deer make extensive use of riparian habitat and hardwood forests. Riparian cover appears to influence abundance of white-tailed deer and they are more commonly associated with agriculture than mule deer (Mackie *et al.*. 1998). White-tailed deer prefer grasses and forbs during spring and early summer, and then switch to new-growth leaves and twigs of small trees and shrubs. Browse is very important for white-tailed deer year-round. In agricultural areas, cultivated crops are important dietary components (Mackie *et al.* 1998).

Approximately 20 percent (61,328 acres) of the Decision Area is identified as general white-tailed deer habitat (MFWP 1999a). The common vegetation communities within this habitat include riparian forests and habitats and woodlands.

Moose

Moose are closely associated with densely forested and riparian habitats and depend upon woody vegetation, preferably in early successional stages that occur following disturbances (Foresman 2001; Franzmann 1981). They tend to use mountain meadows, river valleys, wetlands, and clear cut areas in the summer and utilize willow flats and mature coniferous forests in the winter. They prefer feeding on forbs and aquatic or woody vegetation depending on the season. Moose are adapted to deep snow and extreme cold temperatures and have difficulties coping with warmer temperatures (above 20 °C) (Foresman 2001).

Moose are distributed widely throughout the PA where suitable habitat is present. Within the PA, there are 2,398,598 acres of general moose habitat, which is approximately 33 percent of the PA. Of the general moose habitat in the PA, the BLM manages six percent (18,559 acres) (MFWP 1999a). An estimated 13 percent of the PA is moose general/winter habitat. A significant portion of the moose habitat in the Decision Area is found within the Big Hole and Boulder river basins. In addition, Mount Haggin Wildlife Management Area (56,151 acres) occurs within the PA and has a management goal of providing year-round habitat for moose.

The last completed Progress Report on moose done by the MFWP was in 2001 (MFWP 2001a). The trend information presented in this report was based on harvest and hunter day trends and indicated that moose populations within Region 3 had some fluctuations between 1996 and 2001, but were relatively stable.

Pronghorn

Pronghorn are found within open sagebrush or grassland areas within the PA. Sagebrush grasslands are the preferred winter habitat as browse is a critical food source during this period. Maintenance of healthy range condition is important for pronghorn management as forbs are important during the spring fawning period. The highest annual mortalities are generally related to spring blizzards. Pronghorn tend to avoid areas with vegetation higher than 38 cm as it interferes with their visibility and detection of predators (Yoakum 1978).

Approximately 16 percent (1,143,677 acres) of the PA represents pronghorn habitat with the BLM managing 72,559 acres of that habitat (MFWP 1999a). The majority of this habitat is located in the Boulder River basin and the Elkhorn Mountains. The last MFWP published report discussing the condition of pronghorns within Region 3 was completed in 2002. This report stated that during the period of 1996 to 2001, antelope populations

within the region were stable and the trends generally remained unchanged (MFWP 2002c). Approximately 90 percent of the pronghorn overall distribution and winter range within the PA occurs in the grassland/shrubland zone.

Pronghorn can be in conflict with livestock grazing, especially range fences. Fences can inhibit the movement of pronghorn because they have a tendency to crawl under the fences rather than jump over them. This can become a serious issue in the winter, especially severe winters, as fences can bisect major winter migration routes and, as snow levels become deep, the pronghorn are unable to crawl underneath the fences. Sheep, mesh or field fence can also prevent the movement of pronghorn because these woven wire types of fence do not allow pronghorn to crawl beneath. To allow for pronghorn to pass under fences, wire fences should be designed with 3 wires placed at 16-inch, 26-inch, and 36-inch heights.

Bighorn Sheep

Bighorn sheep have a limited distribution within the PA and typically use areas with cliffs, mountain slopes, or rolling foothills. Winter habitat generally occurs on open slopes or ridges where grass is available. Grass and shrubs are common food sources during the winter while grass, sedges, and forbs are heavily used in the spring and summer. Winter range is the limiting factor for bighorn sheep herds; therefore, identification and management of winter range is important for management of healthy bighorn populations.

Bighorn sheep tend to forage in open areas with low vegetation such as grasslands, shrublands, or mixes of these and avoid foraging on slopes with shrub or canopy cover in excess of 25 percent and shrubs 2 feet (60 cm) or higher. Proximity to escape cover and open aspects with good visibility are important features of quality bighorn sheep habitat, particularly for females with young. Bighorn sheep prefer open habitats which facilitate predator detection and enhance visual communication of alarm postures.

Approximately 712,000 acres within the PA are bighorn sheep habitat. Winter range is approximately 187,000 acres of that with the BLM managing 54,000 acres (29 percent) (**AMS Figure 2-18**) (MFWP 1999a). The majority of the winter range mapped within the PA occurs in the Upper Missouri area, the Elkhorn Mountains and the Big Hole River Basin. The dominant vegetation communities in this habitat are grassland/shrubland and woodland communities.

Bighorn Sheep have been re-introduced into three areas in the PA; Sleeping Giant Wilderness Study Area, Soap Gulch (Camp Creek) and Shep's Ridge (Indian Creek/Crow Creek). The last published report done by MFWP discussing the condition of bighorn sheep within Region 3 was completed in 2002. The Sleeping Giant population was declining prior to 1999 due to poor nutrition (MFWP 2002b). The population seemed to be increasing until 2001 at which time a die-off within the population was documented. Approximately 50 sheep were relocated to Soap Gulch/Camp Creek between 2000 and 2001. The Camp Creek population experienced a die-off between 1994 and 1995 due to a pneumonia complex. Six years after the die-off, the recruitment was minimal, although the animals appeared to be healthy. The Shep's Ridge population was healthy and expected to continue growth, as of 2002 (MFWP 2002b).

Bighorn sheep are highly susceptible to some strains of *Pasteurella* carried by domestic sheep. Bighorn sheep usually die after exposure to specific strains of *Pasteurella* from healthy domestic sheep.

Mountain Goats

Mountain goats utilize areas with steep, broken terrain and can sometimes utilize subalpine forests. They typically utilize distinct summer and winter ranges with snow accumulation strongly influencing selection of winter range. Mountain goats utilize south facing slopes, canyon walls and windblown ridges in the winter, and meadows, ravines, cliffs, and sometimes forests in the summer. Common food sources include grass, sedges, lichens, and shrubs. Mountain goats are fairly sensitive to disturbance and overharvest.

Mountain goats have been transplanted in various locations within the PA. Within the MFWP Region 3, four of the populations are native, and the rest either are transplants or are the result of dispersing transplant populations. The last Mountain Goat Progress Report completed by the MFWP (MFWP 2001b) indicated that the majority of the populations within Region 3 were either stable or increasing.

Limited mountain goat range occurs within the PA and populations have been steadily declining over the last decade. Due to low population numbers, accurate census data is limited. Within the PA, there are approximately 705,000 acres of mountain goat habitat mapped with the BLM managing about 19,000 acres (3 percent) (MFWP 1999a). The majority of this habitat occurs in the Upper Missouri area. There are four known individual mountain goats utilizing BLM land within the Sleeping Giant Wilderness Study Area. The population has been decreasing since the early 1990's when the population contained 50 individuals. The vicinity of the Sleeping Giant Wilderness Study Area provides approximately 15,000 acres of mountain goat habitat.

Black Bear

Black bears use a variety of habitats depending on seasonal variation in diet and availability of food. Black bears are omnivorous; however, a significant portion of their diet consists of berries, fruits, grasses, sedges and inner bark. The entire PA is black bear habitat; however,

they tend to prefer dense forested areas, riparian areas, open slopes, and mountain meadows (Foresman 2001).

The most recent Black Bear Progress Report compiled by the MFWP Region 3 was completed in 2002 (MFWP 2002e). These reports were based on the harvest data received from 1996 to 2001. The harvest trends during these years indicated that bear populations in Region 3 were declining; however, the significance of this decline was not discussed. The report also identified that the majority of black bear harvesting within Region 3 occurred in the eastern portion of the region.

Black bears tend to be relatively tolerant of land uses as they have a large home range and can utilize a variety of habitats. Recreation, road development, and timber management are land uses that tend to have the greatest impacts to black bear habitat. Road development within the PA is at a moderate level of 1.8 miles per square mile (mi/mi^2) and has not been identified as negatively impacting black bear habitat. Timber harvest can cause temporary disturbance and displacement of black bears; however, small timber cuts can improve black bear habitat by increasing the vegetation diversity.

Mountain Lion

Mountain lions are distributed throughout the PA where suitable habitat is present. They use a variety of vegetation types, depending on prey availability, cover, and preference for areas with minimal human disturbance. Mountain lions typically prefer mountainous and foothill areas; however, in eastern Montana, they are commonly associated with riparian areas and woody draws. Mountain lions are carnivorous and feed on a variety of animals. However, they prefer deer, elk, porcupine, and rabbit.

Gamebirds

The PA provides habitat for a variety of upland gamebirds and waterfowl. Blue grouse and spruce grouse occupy the coniferous forests, while ruffed grouse, sharp-tailed grouse, and Merriam's turkey are found in dryer coniferous forests, brushy draws, riparian areas, or grassland areas with a strong presence of shrubs. Sage grouse are a sagebrush obligate species and are discussed further under the sensitive species section. Ring-necked pheasant, chukar, and gray partridge are also found in the grasslands and croplands within the PA. Ducks and geese also utilize the PA for nesting and brood rearing.

The last published Progress Report on upland gamebirds within Region 3 compiled by the MFWP was completed in 1996 (MFWP 1996). This report discussed harvest levels as an indicator of population. A general trend of decline within the late 1980s followed by an increase in the 1990s was observed with all the gamebird species with the exception of the grouse. Ruffed, spruce, blue, and especially sage grouse all experienced a decline throughout 1987 to 1996. There was little data available for snipe, chukar, and mourning dove as little harvest for these birds occurred during the period covered.

SPECIAL STATUS SPECIES

Special-status species are those species listed as threatened or endangered under the Endangered Species Act (ESA), species proposed or candidates for listing, and species designated as "sensitive" by BLM.

Fish

Bull Trout (Listed Threatened)

In the PA, critical habitat includes portions of the Clark Fork River. Historically, bull trout were well distributed throughout the upper Clark Fork but are now rare or non-existent in the main stem Clark Fork River between the Blackfoot River and Warm Springs Creek (MBTSG 1995). Bull trout do reside however, in the Blackfoot River. Some sections of Warm Springs Creek contain bull trout but they are primarily resident populations residing in the headwaters and Barker Lake, Storm Lake, Twin Lakes, Cable Creek, and Foster Creek.

According to the "Upper Clark Fork River Drainage Bull Trout Status Report", Warm Springs Creek is a core area and nodal habitat for bull trout (MBTSG 1995). Core areas are drainages that currently contain the strongest remaining populations of bull trout. They are usually relatively undisturbed and need to have the most stringent levels of protection as they can potentially provide stock for re-colonization. Nodal habitat includes waters containing migratory corridors, over-wintering areas and other critical habitat.

Westslope Cutthroat Trout (BLM Sensitive)

The westslope cutthroat trout is a sub-species of cutthroat trout native to Montana. Its natural range is on both sides of the Continental Divide; excluding the Yellowstone River drainage.

In the PA, westslope cutthroat trout are found in the Blackfoot, Clark Fork, Upper Missouri, Madison, Jefferson, Gallatin, Boulder, and the Big Hole rivers as well as many of their tributaries. **AMS Figures 2-21a through 2-21i** depict current habitat in the PA known to support westslope cutthroat trout. Some of the streams in the PA that support westslope cutthroat trout are small and have very low late summer flows. Small young of the year and yearling westslope cutthroat trout can be found in streams less than 18 inches in width.

There are four primary reasons for the decline of this species. First, habitat has been loss due to poor grazing practices, historic logging practices, mining, agriculture, residential development, and the lingering impact of forest roads. Fish have been unable to use spawning habitat due to dewatering of streams for irrigation and because of barriers created by dams and road culverts.

Second, non-native species (brook trout, lake trout, brown trout, and northern pike) out-compete juvenile cutthroat trout for food or prey on cutthroat trout. Barriers that disrupted historical migration routes for westslope cutthroat trout have sometimes served to protect them from non-native species.

A third reason for decline is hybridization with other species. Westslope cutthroat trout hybridize with rainbow trout and other non-native cutthroat trout subspecies. Many remnant genetically pure cutthroat trout populations, on both sides of the Continental Divide, are located above barriers that protect them from non-native species.

The fourth cause of decline has been overfishing. Westslope cutthroat trout are highly susceptible to angling (Behnke 1992) but it is uncertain how much of an impact this has had on the species' overall decline.

Montana has developed a Conservation Agreement (MFWP 1999b). This agreement prioritizes protecting genetically pure populations first, then slightly introgressed populations.

Yellowstone Cutthroat Trout (BLM Sensitive)

The historical distribution of Yellowstone cutthroat trout is believed to have included much of the Yellowstone River basin, including portions of the Clark Fork of the Yellowstone River, Bighorn River, and Tongue River basins in Montana and Wyoming, and parts of the Snake River basin in Wyoming, Idaho, Utah, and Nevada (Behnke 1992). In recent times, the majority of the indigenous populations in Montana inhabit headwater streams, although the Yellowstone River main stem also supports large numbers of indigenous Yellowstone cutthroat trout. Due to the stocking of Yellowstone cutthroat trout, the distribution of this fish in lakes has actually increased, as it is now believed that over 100 lakes in Montana support pure Yellowstone cutthroat trout, some of which are found in the PA.

Nonnative fish may be the greatest threat to the persistence of Yellowstone cutthroat trout. Because Yellowstone cutthroat trout and rainbow trout readily hybridize and produce fertile offspring, hybrid populations often become established. Introductions or invasions of brown trout and brook trout have led to displacement of cutthroat trout throughout the western U.S.

The widespread stocking of nonindigenous populations of Yellowstone cutthroat trout often leads to genetically homogeneous populations and may be detrimental to their long-term persistence.

The influence of other nonnative organisms also threatens the persistence of Yellowstone cutthroat trout. Yellowstone cutthroat trout are probably susceptible to infection by whirling disease. The effects of New Zealand mud snail on trout populations and aquatic ecosystems are unknown but also could be detrimental. This snail is presently found in the Madison, Snake, and Yellowstone rivers and is likely to be inadvertently introduced (probably by anglers) into additional waters.

Habitat degradation is thought to favor certain nonnative fishes and can directly affect Yellowstone cutthroats. Because many populations of Yellowstone cutthroat trout possess complex life histories relying on movement among diverse habitats, disruptions in habitat quality or availability may lead to extinction of isolated populations.

Historically, intensive harvest by anglers altered the size structure and abundance of Yellowstone cutthroat trout in some waters. However, harvest restrictions appear to protect Yellowstone cutthroat trout under severe angling pressure.

Arctic Grayling (BLM Sensitive)

The Arctic grayling is a native species to Montana and the only remaining indigenous fluvial population in Montana is found in the Big Hole River. Currently, Arctic grayling are found in the Big Hole River, in the Madison River near Ennis, or in small, clear, cool lakes with tributaries suitable for spawning. In the PA, Arctic grayling are found in the Big Hole River and Park Lake within the Missouri River drainage and Heart Lake within the Clark Fork Drainage.

The fluvial Arctic grayling was formally classified as a Candidate species in 1991. A petition to upgrade the status of the fluvial Arctic grayling to Endangered was submitted in October 1991. A recent finding on the petition recommended that listing was not warranted since the population does not constitute a distinct population segment as defined by the ESA.

Although fluvial Arctic grayling inhabit the entire Big Hole River, highest densities occur in the vicinity of Wisdom. The majority of spawning occurs near Wisdom in the main stem and several tributaries. Fluvial Arctic grayling rear in the vicinity of where they hatch; thus, the Wisdom area provides the majority of rearing habitat. Moderate densities of Arctic grayling reside between the mouth of the North Fork Big Hole River and Dickie Bridge. Limited spawning occurs in lower reaches of several tributaries within this reach. Rainbow trout and brown trout increase in abundance below Dickie Bridge, where Arctic grayling are found in low densities.

Factors potentially threatening survival of Arctic grayling in the Big Hole River include water quality and quantity, competition with introduced species, predation, habitat degradation, and angling. Water quantity issues include drought and recruitment limitation due to sudden runoff events. Sudden increases in stream flows during hatching and emergence of larval Arctic grayling may decrease survival and limit recruitment in the Big Hole River. Extreme flood flows may also severely impact Arctic grayling recruitment in the Big Hole River.

Extreme low flows during severe drought decrease survival of older Arctic grayling due to high water tempera-

tures, increased susceptibility to predation, and diminished habitat volume. Diversion of water for agriculture has exacerbated persistent drought conditions. All salmonid species in the upper Big Hole River have declined in abundance during the present drought.

The distribution of Arctic grayling in the Big Hole basin suggests that they are being displaced by non-native brown and rainbow trout through competition. Predation on juvenile Arctic grayling by all non-native species is also a source of mortality.

Historically, angling may have impacted fluvial Arctic grayling populations in Montana because they are easily caught by anglers and susceptible to over-harvest; however, catch-and-release-only regulations enacted in 1988 in the Big Hole River appear to adequately protect the Arctic grayling population from over-exploitation.

Another factor potentially limiting grayling in the Big Hole River is habitat degradation. Degradation of riparian vegetation and stream banks by cattle grazing, mass willow removal, and dewatering the river for agricultural uses have negatively impacted fish habitat. High levels of fine sediments, high mid-summer water temperatures, and loss of suitable habitat volume have impacted Arctic grayling in the Big Hole River.

Northern Redbelly Dace Hybrid (BLM Sensitive)

The northern redbelly dace x finescale dace hybrid (*Phoxinus eos x P. neogaeus)* is a Montana species of special concern, Class C. It was placed on the species of concern list due to its rarity and unusual form of genetic reproduction. Northern redbelly dace prefer quiet waters such as beaver ponds, bogs, and clear streams. The finescale dace likes similar habitat but is also found in larger lakes. These dace spawn in the spring and early summer.

Further inventory is needed to better define dace distribution in Montana. Due to difficulties of field differentiation, it is likely that some waters thought to contain only northern redbelly dace may also have the hybrid.

Wildlife

Following is a discussion of the current habitat and status of those species identified in **Table 3-15** to have the potential to occur within the PA.

Grizzly Bear (Listed Threatened, Northern Continental Divide Ecosystem Recovery Zone)

Portions of two grizzly bear recovery zones overlap the PA. The very southeastern tip of the Northern Continental Divide Ecosystem Recovery Zone overlaps the northwest corner of the PA. The Yellowstone Ecosystem Recovery Zone overlaps the southern portion of the PA, north and east of Yellowstone National Park. Occupied habitat extends north of the Yellowstone Recovery zone to near Interstate-90, between Livingston and Bozeman (**AMS Figure 2-19**).

Within the Northern Continental Divide Ecosystem Recovery Zone, 17,100 acres occur within the PA; however, the BLM does not manage any of this land. Of the area that has been identified and delineated as occupied grizzly bear habitat within the Northern Continental Divide Ecosystem, 232,240 acres occur in the PA with approximately 8,000 acres (3 percent) of that being under BLM management. Within the Yellowstone Ecosystem Recovery Zone, 994,670 acres occurs within the PA; however, the BLM does not manage any of this land. Of the occupied grizzly bear habitat within the Yellowstone Ecosystem Recovery Zone, 1,881,415 acres occur in the PA with approximately 5,775 acres (less than one percent) of that being under BLM management.

The road density within the PA portion of the Yellowstone Ecosystem is low at an average of 1.0 mi/mi^2 of roads. The road density within the Northern Continental Divide Ecosystem is considerably higher with an average of 2.6 mi/mi^2. This level is higher than the average road density for the entire PA which is 1.8 mi/mi^2.

Grizzly bear corridors with the highest likelihood of successful transfer between the Greater Yellowstone and Northern Continental Divide Ecosystems occur in the Gallatin, Bridger, and Big Belt mountain ranges. Secondary corridors occur in the Taylor-Hilgard, Gravelly, Tobacco Root, White-tail/O'Neil, and Boulder mountain ranges (Walker and Craighead 1997).

Similarly, modeling predicted that 70 percent of the PA is core, sub-core, or corridor habitat, with 65 percent of the Decision Area in core, sub-core, or corridor habitat (Craighead *et al.* 2002).

Canada Lynx (Listed Threatened)

Canada lynx are classified as a furbearer in Montana but the trapping season is currently closed. In Montana, lynx are found in mountain and forest regions. East of the Continental Divide the subalpine forests inhabited by lynx occur at higher elevations (1,650 to 2,400 meters) and are composed mostly of subalpine fir. Secondary habitat is intermixed Englemann spruce and Douglas-fir habitat types where lodgepole pine is a major seral species (Ruediger *et al.* 2000). Throughout their range, shrub-steppe habitats may provide important linkage habitat between the primary habitat types described above (Ruediger *et al.* 2000).

Approximately 30 percent of the PA is lynx habitat (cool, moist conifer zone and subalpine fir zone). Approximately eight percent (21,738 acres) of the Decision Area is cool, moist conifer zone, while one percent (1,796 acres) is subalpine fir zone. Based on lynx habitat and linkage zone mapping (USDA-FS and USDI-BLM 2004), approximately 212 square miles of lynx linkage areas occur within the PA.

Table 3-15
Special Status Wildlife Species in the PA

Common	Scientific Name	Status	Found In PA?	Habitat
Threatened and Endangered Species				
Canada lynx	*Felis lynx*	Threatened	Yes	Wet forest habitats, with large woody debris, and suitable habitat for primary prey (snowshoe hare) present (usually above 4000 feet elevation).
Grizzly bear (Northern Continental Divide Population)	*Ursus arctos horribilus*	Threatened	Yes	Remote forest habitats with low road density and minimal human disturbance.
Black-footed ferret	*Mustela nigripes*	Endangered	No	Prairie habitats with large prairie dog colonies, marginal habitat present in PA.
Whooping crane	*Grus americana*	Threatened	No	Wetlands and meadows that provide food and resting habitat for migrating cranes Migratory habitat present in PA.
Piping plover	*Charadrius melodus*	Threatened	No	Wetlands, lakes, and ponds having shorelines and beaches with sparse vegetation. Habitat not present in PA.
Sensitive Bird Species				
Baird's sparrow	*Ammodramus bairdii*	Sensitive	No	Prairie grasslands of northern and eastern Montana, PA outside range of occurrence.
Bald eagle	*Haliaeetus leucocephalus*	Sensitive (De-listed)	Yes	Nesting and perching trees near water with primary prey species (fish and waterfowl) present.
Black-backed woodpecker	*Picoides arcticus*	Sensitive	Yes	Foraging and nesting habitats in conifer forests that have insect infestations associated with fire and disease.
Black tern	*Chilidonias niger*	Sensitive	No	Colonial nester in marshes. Habitat present in PA.
Blue-gray gnatcatcher	*Polioptila caerulea*	Sensitive	No	Breeding habitat in Montana is restricted to open stands of Utah juniper and limber pine with intermixed big sage. PA outside range of occurrence.
Brewer's sparrow	*Spizella breweri*	Sensitive	Yes	Short-grass prairie with scattered or abundant sagebrush, or other arid shrub habitats.
Burrowing owl	*Athene cunicularia*	Sensitive	Yes	Prairie grasslands and shrublands often in prairie dog or ground squirrel burrows.
Chestnut-collared Longspur	*Calcarius ornatus*	Sensitive	Yes (not in DA)	Native mixed-grass prairie.
Common loon	*Gavia immer*	Sensitive	Yes (migration)	Floating nest in lakes in or near emergent wetland vegetation. Migrant on lakes and reservoirs. Pres
Dickcissel	*Spiza americana*	Sensitive	No	Open meadows and grasslands in eastern Montana. PA outside range of occurrence.

Table 3-15
Special Status Wildlife Species in the PA

Common	Scientific Name	Status	Found In PA?	Habitat
Ferruginous hawk	*Buteo regalis*	Sensitive	Yes	Grassland and shrublands in rolling foothills and middle elevation plateaus.
Flammulated owl	*Otus flammeolus*	Sensitive	Yes	Nests primarily in mature and old-growth ponderosa pine and Douglas-fir forests.
Franklin's gull	*Larus pipixcan*	Sensitive	Yes (migration)	Breeds on large relatively permanent prairie marsh complexes.
Golden eagle	*Aquila chrysaetos*	Sensitive	Yes	Prefers open habitats and nests on cliffs or large trees.
Great grey owl	*Strix nebulosa*	Sensitive	Yes	Nests in snags, cavities, and stick nests in mature conifer forest, often near meadows and forest openings.
Greater sage grouse	*Centrocercus urophasianus*	Sensitive	Yes	Obligately linked to sagebrush habitat for nesting and wintering. Historically, this species is present, but not documented breeding since 1992. Habitat is present.
Harlequin duck	*Histrionicus histrionicus*	Sensitive	No	Nests along large, fast-flowing mountain streams. Habitat Present in PA.
LeConte's sparrow	*Ammodramus leconteii*	Sensitive	No	Prefer wet meadows dominated by sedges or grasses. PA outside range of occurrence.
Loggerhead shrike	*Lanius ludovicianus*	Sensitive	Yes	Open shrub and grassland habitats.
Long-billed curlew	*Numenius americanus*	Sensitive	Yes	Nests and forages in prairie grasslands and shrublands.
Marbled godwit	*Limosa fedoa*	Sensitive	No	Breeds primarily in the Prairie Pothole Region with short-grass to mixed-grass prairie. PA outside range of occurrence, however, migratory habitat is present.
McCown's longspur	*Calcarius mccownii*	Sensitive	Yes (not in DA)	Characteristic of shortgrass prairie.
Mountain plover	*Charadrius montanus*	Sensitive	Yes	Arid shortgrass prairie, often in association with prairie dog colonies.
Nelson's Sharp-tailed sparrow	*Ammodramus nelsoni*	Sensitive	No	Nests in grassland, marsh edges, and herbaceous wetlands. PA outside range of occurrence.
Northern goshawk	*Accipiter gentilis*	Sensitive	Yes	Nests in mature to old-growth conifer and aspen forest
Peregrine falcon	*Falco peregrinus anatum*	Sensitive	Yes	Nests on ledges and cliffs, often near water with prevalent prey base (birds).
Red-headed woodpecker	*Melanerpes erythrocephalus*	Sensitive	No	Open country, open groves of large trees or groups of scattered trees in fields, and old burns. Cavity nester. PA outside range of occurrence.

Table 3-15
Special Status Wildlife Species in the PA

Common	Scientific Name	Status	Found In PA?	Habitat
Sage sparrow	*Amphispiza belli*	Sensitive	No	Nests in sagebrush/grassland habitats. Habitat present in PA.
Sage thrasher	*Oreoscoptes montanus*	Sensitive	Yes	Limited almost entirely to semi-dry regions and communities containing extensive sagebrush.
Sedge wren	*Cistothorus platensis*	Sensitive	No	Breeding habitat is wet meadows and marsh edges. PA outside range of occurrence.
Sprague's pipit	*Anthus spragueii*	Sensitive	Yes (not in DA)	Prefers native, medium to intermediate height prairie.
Swainson's hawk	*Buteo swainsoni*	Sensitive	Yes	Nests in trees, often in riparian areas.
Three-toed woodpecker	*Picoides tridactylus*	Sensitive	Yes	Breeds and forages in conifer forests with high incidence of insect infestation from fire, disease, or wind throw.
Trumpeter swan	*Cygnus buccinator*	Sensitive	Yes (not in DA)	Nests in emergent vegetation at edge of lakes and ponds.
White-faced ibis	*Plegadis chihi*	Sensitive	No	Large marshes and wetlands with emergent vegetation. Habitat present in PA.
Willet	*Cataptrophorus semipalmatus*	Sensitive	Yes	Shallow wetlands in the northern Great Plains, nests mainly in native prairie and grasslands.
Wilson's phalarope	*Phalaropus tricolor*	Sensitive	Yes (not in DA)	Breeds around shallow, marshy wetlands on the plains.
Yellow rail	*Coturnicops noveboracensis*	Sensitive	No	Breeding habitat consists of wet sedge meadows and other wetlands. PA outside range of occurrence.
Sensitive Mammal Species				
Black-tailed prairie dog	*Cynomys ludovicianus*	Sensitive	Yes	Associated with grasslands and shrub/grassland in relatively level sites.
Fisher	*Martes pennanti*	Sensitive	Yes (not in DA)	Mature conifer communities, often associated with riparian areas in boreal forests.
Fringed myotis	*Myotis thysanodes*	Sensitive	Yes	Variety of habitats from low to mid-elevation grass, woodland, and desert regions, up to and including spruce-fir forests.
Fringe-tailed myotis	*Myotis thysanodes pahasapensis*	Sensitive	No	Prefers dry, coniferous forests, ponderosa pine, and juniper. PA outside range of occurrence.

Table 3-15
Special Status Wildlife Species in the PA

Common	Scientific Name	Status	Found In PA?	Habitat
Gray Wolf	*Canis lupus*	Sensitive (de-listed in March 2008)	Yes	Forest and shrubland habitats with adequate prey base of big game animals present.
Great Basin pocket mouse	*Perognathus parvus*	Sensitive	No	Desert and semi-desert habitats dominated by sagebrush and grassland communities. Marginal habitat present in PA.
Grizzly Bear (Yellowstone Population)	*Ursus arctos horribilus*	Sensitive (De-listed)	Yes	Remote forest habitats with low road density and minimal human disturbance.
Long-eared myotis	*Myotis evotis*	Sensitive	Yes	Often associated with forested stands containing old-growth characteristics, but found in habitats characterized by shrubland and juniper.
Long-legged myotis	*Myotis volans*	Sensitive	Yes	Primarily montane coniferous forest and riparian habitat.
Northern bog lemming	*Synaptomys borealis*	Sensitive	Yes (not in DA)	Open fens and forested wetlands with dense cover of mosses and sedges. Habitat present in PA.
Pallid bat	*Antrozous pallidus*	Sensitive	No	Associated with dry, desert environments, but range into oak and pine forests. PA outside range of occurrence.
Northern myotis	*Myotis septentrionatis*	Sensitive	Potentially	Mixed and coniferous forests. Hibernacula often occur in abandoned mines and narrow crevices.
Pygmy rabbit	*Brachylagus idahoensis*	Sensitive	Yes	Can be found in a variety of sagebrush structures, but have found to show a preference for dense stands of big sagebrush, often along drainages with alluvial soil deposition.
Spotted bat	*Euderma maculatum*	Sensitive	No	Roosts in arid habitats with cliffs and crevices and forages over meadows, wetlands, and water bodies. Habitat not present in PA.
Swift fox	*Vulpes velox*	Sensitive	No	Prairie habitats with high density of small mammals (ground squirrels or prairie dogs), its primary prey. PA outside range of occurrence.
Townsend's big-eared bat	*Plecotis townsendii*	Sensitive	Yes	Roosts and hibernates in caves and mines and forages over open areas with wetlands and riparian communities.
Western spotted skunk	*Spirogale gracilis*	Sensitive	Yes	Woody, brushy habitat often in riparian areas.
Wolverine	*Gulo gulo luscus*	Sensitive	Yes	Forages in remote areas of boreal forests and dens in high-elevation cirques.
White-tailed prairie dog	*Cynomys leucurus*	Sensitive	No	Grassland and sagebrush habitat of southeastern Montana. PA outside range of occurrence.

Table 3-15
Special Status Wildlife Species in the PA

Common	Scientific Name	Status	Found In PA?	Habitat
Reptiles and Amphibians				
Snapping turtle	*Chelydra serpentina*	Sensitive	No	Large rivers in eastern Montana. PA outside range of occurrence.
Spiny softshell turtle	*Trionyx spiniferus*	Sensitive	No	Large rivers in eastern Montana. PA outside range of occurrence.
Boreal/Western toad	*Bufo boreas*	Sensitive	Yes	Uses a variety of habitats including low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near tree line.
Coeur d'Alene salamander	*Plethodon idahoensis*	Sensitive	No	Wet areas near waterfalls, with dense moss cover in extreme western Montana. PA outside range of occurrence.
Great Plains toad	*Bufo cognatus*	Sensitive	No	In Montana they seem to prefer the higher elevations of short-grass prairies or undifferentiated grasslands, meadows within open stands of ponderosa pine, and areas near streams and irrigated lands. PA outside range of occurrence.
Greater short-horned lizard	*Phrynosoma hernandesi*	Sensitive	Yes	Ridge crests between coulees, and in sparse, short grass and sagebrush with sun-baked soil. Current status is unknown.
Northern leopard frog	*Rana pipiens*	Sensitive	No	Wetlands and water bodies. Historically present but none documented recently.
Plains spadefoot	*Spea bombifrons*	Sensitive	Yes	Found in arid grasslands and sagebrush with sandy or loose soils; usually near permanent or temporary water bodies.
Milk snake	*Lampropeltis triangulum*	Sensitive	Unknown	Sandstone bluffs, rock outcrops, grasslands, open ponderosa pine and juniper stands. Habitat is present.
Western Hog-nosed snake	*Heterodon nasicus*	Sensitive	No	Arid areas, prairie grasslands and shrublands, floodplains with gravely or sandy soils. PA outside range of occurrence.

Sources: Foresman 2001; MTNHP 2004; MPIF 2000; Maxell et al 2003; Reichel and Flath 1995, MBDD 2005; Lenard et al. 2003.

Gray Wolf (De-listed/BLM Sensitive)

The gray wolf was de-listed from the Endangered Species Act in March, 2008. Before de-listing, the majority of the PA was within the Greater Yellowstone Recovery and Central Idaho Areas; populations in these areas weredesignated as nonessential experimental. A relatively small northwestern portion of the PA was in the Northwest Montana Recovery Area where wolves had endangered status. As reported in the 2004 Annual Report (USFWS *et al.* 2005), there are an estimated 835 wolves within the Northern Rocky Mountain Recovery Areas and 153 of those occur in Montana.

There essentially was no increase in the wolf population numbers in 2004 within the Greater Yellowstone Recovery Area and it is believed that the wolf population in this area has stabilized (USFWS *et al.* 2005).

Bald Eagle (De-listed/BLM Sensitive)

MFWP has been conducting bald eagle nest surveys since the early 1990's. Bald eagles have been documented throughout the PA. Breeding eagles can be found on the Missouri, Jefferson, and Yellowstone rivers. Resident bald eagle populations occur in the Upper Missouri River area at Hauser Lake and monitoring of these populations has occurred since the 1970's (Restani and Harmata 1997).

There are currently approximately 50 nest sites documented within the PA, although, not all of them are active annually. The mean brood size and nesting success has been steadily increasing for bald eagles within Montana. Bald eagle concentrations at Hauser Lake have been found to be strongly correlated to the presence of salmon (MBEWG 1994). From 1991 to 1996, 100 to 300 migrating eagles were identified to congregate at Hauser Lake. These numbers have declined due to a decline in kokanee salmon within the lake. By 2000, fewer than 20 bald eagles were documented utilizing the area. MFWP have been stocking the salmon at Hauser Lake in an attempt to restore the fishery, but have not been successful. The entire PA is potential winter habitat for bald eagles, although the larger rivers with fisheries are used more commonly.

Golden Eagle (BLM Sensitive)

In Montana, golden eagles eat primarily jackrabbits, ground squirrels, and carrion. They occasionally prey on deer and antelope fawns, small mammals, waterfowl, and grouse. Golden eagles nest on cliffs, in large trees, or occasionally on artificial structures such as power poles.

Approximately 60 percent of the PA is representative golden eagle habitat (grass and shrubland, woodland or agriculture). In 1996, surveys were conducted within the PA to determine population status and reproductive success (Markum and Harmata 1996). Within the 20,000 square kilometers (km^2) that was surveyed, 84 breeding areas were located containing 142 nests. Only 29 percent of the potential breeding areas were occupied and only six young were produced. These surveys were repeated in 1997 (Markum and Harmata 1997), and although they found that the number of pairs available for breeding, actual breeding attempts, and the overall number of young produced increased, the differences between years were not significant and were suspected to be due to proper survey timing and the use of aerial surveys.

The 1997 surveys documented 28 active breeding areas and 16 young produced.

Burrowing Owl (BLM Sensitive)

Burrowing owls are widely distributed east of the Continental Divide in Montana. They are typically associated with open grasslands and commonly use abandoned burrows of mammals for nest sites. Burrowing owls are opportunistic feeders and their diet varies with the seasons. Their historic range expands into the PA; however, there is no recent documentation of burrowing owls within the PA. The reduction in prairie dog populations is believed to be contributing to the decline of these owls.

Brewer's Sparrow (BLM Sensitive)

Brewer's sparrows are sagebrush obligate species that prefer sites with high shrub cover and large patch size (Ashley and Stoval 2004). Their open cup shaped nests are typically found in live big sagebrush. These sparrows occur within the PA and breeding habitat has been documented (Lenard *et al.* 2003).

Sage Grouse (BLM Sensitive)

Sage grouse are sagebrush obligate species that prefer sagebrush stands with a canopy cover of at least 20 percent and a height of 8 inches or higher. Research conducted in Montana found that breeding habitat usually occurs in sagebrush habitat with 20 to 50 percent sagebrush canopy cover (MSHWG 2005). Leks are typically located in areas of bare ground or low-density vegetation such as ridge tops. Nesting typically occurs within two miles of the lek and has a sagebrush canopy cover between 15 to 30 percent. Sage grouse populations in Montana are at low levels and are declining. Statewide, population numbers for sage grouse were relatively stable until 1984, while sage grouse declined from 1991 through 1996 and increased through 2000 (MSGWG 2005). Approximately nine percent (2,354,572 acres) of the statewide sage grouse habitat occurs within Region 3 and there are 36 known active leks in this region.

Historically, general sage grouse habitat comprised 1,620,000 acres within the PA, which has been reduced to approximately 340,000 acres. Within the PA, there are approximately 67,000 acres of sage grouse breeding/nesting habitat. These areas occur within the Big Hole River basin and the Yellowstone area. The BLM manages approximately 1,250 acres (2 percent) of the breeding/nesting habitat and 21,700 acres (6 percent) of

the general habitat (**AMS Figure 2-20**). MFWP monitors several leks in the PA; however, no sage grouse leks have been documented on BLM land in the PA since 1992.

Sage Thrasher (BLM Sensitive)

Sage thrashers are sagebrush obligate as they are common inhabitants of shrub-steppe communities that are dominated by big sagebrush. Nest-site selection is specific as most nests are located within or beneath sagebrush plants with high foliage and branch density (MPIF 2000). Dense patches of large sagebrush plants and low densities of exotic plants also seem to be an important habitat characteristic for sage thrashers. Documented breeding habitat occurs within the PA (Lenard *et al.* 2003).

Chestnut-collared Longspur (BLM Sensitive)

The Montana distribution for chestnut-collared longspurs is east of the Continental Divide on native mixed-grass and tall and short grass prairies. Chestnut-collared longspurs arrive on Montana breeding ground in late April and first clutches are initiated in early to mid-June (MPIF 2000). Flocking occurs as nesting ends in mid-August and migration begins in early September. Historic range occurs in the PA; however, there is no recent documentation of these birds using the PA (MBDD 2005; Lenard *et al.* 2003).

Loggerhead Shrike (BLM Sensitive)

Loggerhead shrikes breed throughout much of eastern Montana in a variety of habitats such as grassland prairies with scattered trees, riparian areas, woody draws, or cultivated land with shelterbelts. In Montana grasslands and shrub steppe, loggerhead shrikes tend to select areas with a significant presence of shrubs and forbs (Dechant *et al.* 1998). Loggerhead shrikes have been documented utilizing the PA (MBDD 2005; Lenard *et al.* 2003).

Long-billed Curlew (BLM Sensitive)

The long-billed curlew breeds throughout Montana and typically nests in the high plains, preferring well-drained native grasslands, sagebrush, and agricultural land with gentle rolling topography (MPIF 2000). Long-billed curlews are found throughout the PA (MBDD 2005; Lenard *et al.* 2003).

McCown's Longspur (BLM Sensitive)

Montana provides a large portion of the available breeding habitat for McCown's longspurs. They can be found throughout Montana, east of the Continental Divide. Historic habitat occurred within the PA; however, there have been no recent documentations of McCown's longspur using the PA (Lenard *et al.* 2003).

Mountain Plover (BLM Sensitive)

Research indicates that mountain plovers were historically widely distributed through the PA. Some early naturalist reports suggest that they were not common, but always associated with short grass prairies (Knowles and Knowles 1998). Mountain plover surveys were conducted within some areas of the PA during 1991 to 1996 (Knowles and Knowles 1997). Plovers were generally associated with *Stipa comata* and *Bouteloua gracilis* habitat types. They were closely associated with slopes under five percent, vegetative heights under six cm, and greater than half the soil surface being bare ground or lichen. Reproduction was documented and approximately 150 mountain plovers were observed.

Sprague's Pipit (BLM Sensitive)

Research suggests that large areas of grassland are preferred by Sprague's pipit and, in some areas, a minimum area of 190 hectares is required (MPIF 2000). The historic range for Sprague's pipit occurred in the southeastern portion of the PA; however, there has been no recent documentation of these birds and only a small portion represents habitat (MBDD 2005; Lenard *et al.* 2003).

Black-backed Woodpeckers (BLM Sensitive)

In Montana, black-backed woodpeckers are most abundant in recent stand-replacing burns (Hill *et al.* 2002). Black-backs are most common in the northwest portion of the state; however, they have been documented in the Big and Little Belt Mountains and the Bridger Range. Surveys documented black-backed and three-toed woodpeckers nesting and successfully breeding in the Nursery Creek area in 2003. Nursery Creek (west side of Elkhorn Mountain Range) had a stand replacing fire in 2000 and was not salvage logged. Surveys for black-backs or three-toes were conducted in a salvage cut in the Boulder area in 2003 and neither was found.

Three-toed Woodpeckers (BLM Sensitive)

Three-toed woodpeckers are mainly found in northwest Montana; however, they have been documented within the PA (MBDD 2005; Lenard *et al.* 2003).

Trumpeter Swan (BLM Sensitive)

The trumpeter swans that breed within Montana are members of the Rocky Mountain population. Breeding trumpeter swans are not common in Montana but nest along the Rocky Mountain front where habitat is present. Wintering birds are mainly found in southwestern Montana. There is the potential for trumpeter swans to occur within the PA as breeding has been documented (MBDD 2005; Lenard *et al.* 2003).

Willet (BLM Sensitive)

Most of the documented occurrences of willets in Montana have occurred east of the Continental Divide in prairie wetlands. Willets prefer a mosaic of wetland types with adjacent grasslands for nesting and brood rearing. There is the potential for willets to occur within

the PA as breeding has been documented within the area (MBDD 2005; Lenard *et al.* 2003).

Black-tailed Prairie Dog (BLM Sensitive)

Historically, there was an estimated 1.5 million acres of black-tailed prairie dog occupied habitat in Montana. This has been reduced to an estimated 100,000 acres (Knowles 2005). Several prairie dog towns have been documented in the southern Elkhorn Mountains and in the Whitehall Valley (Knowles 2005).

There is only one documented prairie dog town within the Decision Area. The town is located at Holter Lake and is approximately 13 acres (402 mounds). BLM has issued a yearlong closure on the discharge of all weapons within the area of this town.

Fisher (BLM Sensitive)

Thought to be extirpated in Montana, fishers were reintroduced into western and northwestern Montana (Foresman 2001). Recently, verified fisher records have been documented in various mountain ranges of western and south-central Montana (Vinkey 2003), including the Beartooth Range. While there are no recent records of fisher in the PA (MTNHP 2004), potential habitat occurs in both the Planning and Decision Areas.

Northern Bog Lemming (BLM Sensitive)

Northern bog lemming habitat does occur within the PA and within the Decision Area. Although they have not been documented on BLM land, there is the potential for them to occur there.

Spotted Skunk (BLM Sensitive)

There are limited documented occurrences of spotted skunks in Montana and they have occurred in the southwestern and south central portion of the state. There is the potential for spotted skunks to occur within the PA and within the Decision Area.

Pygmy Rabbit (BLM Sensitive)

Although pygmy rabbits have typically been associated with relatively tall, dense stands of basin big sage or Wyoming big sage, surveys completed by the BLM have found that pygmy rabbits also utilize stands of mountain, three-tip and low sage (Bockting 2005). Surveys also documented that pygmy rabbits will use stands of low, relatively open sagebrush. Montana is at the northeastern edge of the pygmy rabbits range. There has been documented burrow activity within the PA in the Big Hole River basin as recent as fall of 2004.

Wolverine (BLM Sensitive)

Wolverines occur in coniferous forests within the PA (Foresman 2001; Inman 2004). Wolverines are associated with alpine tundra and coniferous mountain forests of western Montana, especially in large wilderness areas. In Montana, Hornocker and Hash (1981) found most wolverine use in medium to scattered timber, while areas of dense, young timber were used least. Wolverines avoided clearcuts and burns, crossing them rapidly and directly when they were entered at all. Wolverines in the Northern Rocky Mountain region are typically associated with fir, pine, and larch. Aspen and cottonwood stands may also be used in riparian areas and riparian areas may be important winter habitat.

Wolverines do not appear to be dependant on any particular vegetative habitat type habitat requirements appear to be large, isolated tracts of wilderness supporting a diverse prey base, rather than specific plant associations or topography. Dispersing individuals can be found far outside of usual habitats.

In the Decision Area, wolverines may be found at high elevation near Great Divide, Mount Thompson, and Sleeping Giant as well as within linkage corridors. The Sleeping Giant area may provide an important linkage corridor for wolverine between the Big Belt Mountains. A dead wolverine was located by MFWP on the Sheep Mountain ridgeline in the Clancy area. Wolverine tracks and cache were observed by MFWP in the Great Divide area within 2-4 miles of BLM lands.

Townsend's Big-eared Bat (BLM Sensitive)

The occurrence of Townsend's big-eared bat has been documented in at least 25 Montana counties (Foresman 2001) including counties in the PA. Lewis and Clark Caverns, along the southern border of the PA, contain one of four known nursery colonies in Montana (Tipton 2004).

A roosting site was documented on BLM land in Soap Gulch (2003) during AML surveys. Ample foraging habitat and extensive limestone outcrops within the PA provide roosting habitat for Townsend's big-eared bats.

Fringed Myotis (BLM Sensitive)

Western Montana is on the northeastern limit of the distribution of fringed myotis (Foresman 2001). Surveys conducted in 2003 on BLM land near the Big Hole River documented fringed myotis in three locations during mist netting. These bats were found between 5,800 to 6,000 feet elevation. Fringed myotis were also detected in five locations using bat detectors.

Long-eared Myotis (BLM Sensitive)

Long-eared myotis are distributed throughout Montana (Foresman 2001). Long-eared myotis were documented utilizing the Big Hole River area during the 2003 surveys conducted on BLM land.

Long-legged Myotis (BLM Sensitive)

Long-legged myotis range throughout Montana (Adams 2003). Mist net surveys conducted on BLM land within the Big Hole River area in 2003 documented long-legged myotis utilizing the area.

Plains Spadefoot (BLM Sensitive)

There are documented occurrences of plains spadefoot in the PA (Maxell *et al.* 2003).

Boreal (Western) Toad (BLM Sensitive)

While still widespread in western Montana, surveys suggest that populations of boreal toads may be declining (Maxell *et al.* 2003). Boreal toads occur in the PA where there is suitable habitat (Maxell *et al.* 2003) and have been found in the Decision Area in Halfway Creek in the Whitetail Pipestone area.

Northern Leopard Frog (BLM Sensitive)

Once widespread in Montana, leopard frogs appear to be extinct over much of western Montana, west of the Continental Divide (Maxell *et al.* 2003). According to Maxell *et al.* (2003), this species is currently known from only two sites west of the Continental Divide and evidence suggests that populations may have been extirpated from Jefferson County.

Greater Short-horned lizard (BLM Sensitive)

Short-horned lizards' distribution is poorly documented east of the Continental Divide (Maxell *et al.* 2003). While there are old records of this species in Gallatin County, the current status of the species is unknown.

Plants

Special-status species are listed as threatened or endangered under the Endangered Species Act, proposed or candidates for listing, or designated as "sensitive" by BLM (**Table 3-16**).

Musk-root (BLM Sensitive)

Musk-root grows in vernally moist places in mountains, often at the bottom of undisturbed, open rock slides with cold air drainage. There are 11 known occurrences in the state, one historically on BLM land in Jefferson County.

Sitka Columbine (BLM Sensitive)

Sitka Columbine is an herbaceous perennial with stems which are four inches to two feet high and arise from a

Table 3-16
Special-Status Plants Known or with Potential to Occur in the PA

Common and Scientific Name	Status	Habitat
Muskroot *Adoxa moschattelina*	Sensitive 1 occurrence on BLM land	Vernally moist area below talus slopes in mountains
Sitka columbine *Aquilegia Formosa*	Sensitive No occurrences on BLM land	Moist soil of open coniferous, cottonwood, or aspen forests in the montane to subalpine zone.
Sapphire Rockcress *Arabis fecunda*	Sensitive 4 occurrences on BLM land	Steep slopes with big sagebrush or mountain mahogany and sparse tree cover on Madison limestone
Lesser rushy milkvetch *Astragalus convallarius var. convallarius*	Sensitive 6 occurrences on BLM land	Grassland and open pine woodlands
Idaho sedge *Carex idahoa*	Sensitive 1 occurrence on BLM land	Moist alkaline meadows, often along streams
American yellow lady's slipper *Cypripedium parviflorum*	Sensitive 1 occurrence on BLM land	Fen, damp mossy woods, and seepage areas
Linearleaf fleabane *Erigeron linearus*	Sensitive 3 occurrences on BLM land	Dry, often rocky soil from the foothills up to moderate elevations, frequently with sagebrush.
Prostrate hutchensia *Hutchinsia procumbens*	Sensitive No known occurrences on BLM land or in PA	Vernally moist, alkaline soil of sagebrush steppe in the valley to lower montane zones
Dwarf purple monkeyflower *Mimulus nanus*	Sensitive 3 known occurrences in PA	Dry, open, often gravelly, or sandy slopes in the valleys and foothills.
Lemhi beardtongue *Penstemon lemhiensis*	Sensitive 2 occurrences on BLM land	Moderate to steep slopes often on open soils
Mealy primrose *Primula incana*	Sensitive Known occurrences in PA	Saturated, often calcareous wetlands
Ute ladies' tresses *Spiranthes diluvialis*	Threatened No known occurrences on BLM land	Wetlands and swales in broad open valleys, often with calcium carbonate accumulations

Source: BLM and Montana Natural Heritage Program

simple or branched root crown. The plant grows in moist soil of open coniferous, cottonwood, or aspen forests in the montane to subalpine zone. The plant is known from eight locations in southwest Montana near the Madison and Gallatin county boundary.

Sapphire Rockcress (BLM Sensitive)

Sapphire rockcress is an endemic species, known from 21 locations, occurring only in the mountains of southwestern Montana. It is typically found in sagebrush grasslands on steep, dry slopes of limestone-derived soils, on warm exposures with sparse vegetation. It is known to occur in the Decision Area (Silver Bow County) where it grows with mountain mahogany, juniper, or limber pine woodlands. Fire has been frequent in habitats with sapphire rockcress, but the sparse vegetation does not usually carry fires well. Factors that affect the long-term persistence of this species are noxious weed encroachment, grazing and trampling, mining, and herbicide application (MTNHP n.d.).

Lesser Rushy Milkvetch (BLM Sensitive)

Lesser rushy milkvetch is known from 14 locations near Helena, with six of these locations on BLM lands. It grows in grassland and shrublands often in association with bluebunch wheatgrass, fescue species, and mountain big sage.

Idaho Sedge (BLM Sensitive)

Idaho sedge is a regional endemic known from 40 locations in southwestern Montana. One of these occurrences is on BLM land in Silver Bow County. This species grows in moist, alkaline, subirrigated, streamside meadows with other grasses and sedges. Shrubby cinquefoil may also be present. Idaho sedge can withstand light to moderate livestock utilization, but declines under heavy grazing (MNHP n.d.).

American Yellow Lady's Slipper (BLM Sensitive)

There are 72 known occurrences of yellow lady's slipper in Montana, with three in the PA in Lewis and Clark and Gallatin counties. One of these occurrences is on land administered by BLM. This species grows in fens, damp mossy woods, seepage areas, and moist forest-meadow margins in valleys and mountains.

Linearleaf Fleabane (BLM Sensitive)

There are four known occurrences of linearleaf fleabane in the PA; three locations are managed by the BLM in the Scratchgravel Hills area. Mining, grazing, and the encroachment of exotic weeds are factors that may affect long-term population stability. Linearleaf fleabane grows on dry, often rocky soil from the foothills up to moderate elevations, frequently with sagebrush. The low stature of this plant probably means that it responds positively to livestock grazing. Leafy spurge and spotted knapweed threaten populations in the Scratchgravel Hills. Observations suggest that this species may respond positively to disturbance.

Prostrate Hutchinsia (BLM Sensitive)

Prostrate hutchensia is an annual that flowers in June and matures in July. The plant grows in vernally moist, alkaline soil of sagebrush steppe in the valley to lower montane zones. The plant has been found in areas adjacent to, but not in the PA itself.

Dwarf Purple Monkeyflower (BLM Sensitive)

Dwarf purple monkeyflower is only known from a few extent occurrences in the state, plus two historical collections. Populations are generally small and in habitats susceptible to weed invasion. The plant is found in dry, open, often gravelly, or sandy slopes in valleys and foothills. It has been found in three locations in the PA, one of which is adjacent to land managed by the BLM.

Lemhi Beardtongue (BLM Sensitive)

There are 83 known occurrences of Lemhi beardtongue in southwestern Montana, including two in Silver Bow County on land administered by the BLM. This regional endemic, occurring only in southwestern Montana and adjacent Idaho, grows on moderate to steep east and southwest-facing slopes in habitat dominated by sagebrush and bunchgrasses. Fire suppression may be a factor in the range-wide decline. Monitoring studies in Beaverhead County have found that recruitment dramatically increased after fire treatment, consistent with tendency of fire-adapted species to emerge from seed banks following removal of litter and duff (MNHP n.d.).

Noxious weed infestations, especially spotted knapweed tend to invade habitats occupied by Lemhi beardtongue, especially following fire.

Mealy Primrose (BLM Sensitive)

Mealy primrose is known from 22 locations in Montana of which 10 are in the PA. This species grows in saturated wet meadows, often calcareous, with sedges and grasses adapted to wetland growing conditions. Livestock grazing can have variable effects on mealy primrose. Grazing by livestock removes seed heads but does not kill the plant and associated removal of sedges and grasses by grazing reduces shading and allow regrowth from the basal rosettes. Lowered water tables, through draining of wetlands or channel downcutting are the primary threat (MNHP n.d.).

Ute Lady's Tresses (Threatened)

This rare orchid is known to occur at 12 sites in Montana, all on private or state land, mostly in Gallatin, Jefferson, Madison, and Broadwater counties. It grows in wetlands and swales and wet meadows in broad, open valleys, with calcareous carbonate accumulations. It grows in the Piedmont Swamp in Jefferson County.

WILDLAND FIRE MANAGEMENT

Historic Fire Regime

Coarse-scale definitions for historical fire regimes were developed by Hardy *et al.* (2001) and Schmidt *et al.* (2002). The historical fire regimes are based on average years between fires (frequency) combined with the severity (amount of replacement). The regimes are shown in **Table 3-17**. Historic fire regimes for the PA are shown on **AMS Figures 2-11a, 2-11b, and 2-11c.**

Fire Regime Condition Class

A Fire Regime Condition Class (FRCC) is a classification of the departure from the historic fire regime (Hann and Bunnell 2001). The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. **AMS Figures 2-12a, 2-12b and 2-12c** shows fire condition classes for the PA.

In FRCC 1, vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances are considered within the natural (historical) range of variability. Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. The risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.

In FRCC 2, there is a moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances. Fire behavior, effects, and other associated disturbances are moderately departed.

Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate and the risk of loss of key ecosystem components is moderate.

In FRCC 3, there is a high departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances. Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high and the risk of loss of key ecosystem components is high.

Generally, the consensus among fire ecologists (Brown and Smith 2000; Crane and Fisher 1986; Hardy and Arno 1996) is that the structure and composition of most forest communities in the west, including the PA, have been altered by exclusion of natural cycles of fire. Fire suppression in the last century has reduced the frequency and spatial extent of fires in many forest communities. Fire suppression generally has lengthened intervals between fires, contributing to the creation of dense stands with high levels of fuel.

The paradigm most often adopted relative to the historic role of fire is that low to moderate intensity fires increases dominance of Douglas-fir and ponderosa pine on relatively dry sites. These periodic fires pass through the forest, burning needles and debris on the forest floor and lower branches of trees. Fires reduce numbers of seedlings; remove dense understories of saplings and pole-size trees, and thin overstory trees. Prior to fire suppression efforts, fire rarely reached the tree crowns and therefore usually did not kill the large, mature ponderosa pine and Douglas-fir. Exposure of mineral soil, in openings caused by fire, perpetuated reproduction of Douglas-fir and ponderosa pine in a mosaic pattern.

Under pre-settlement fire regimes, low-elevation forests were often more open. Pre-1900 fires often covered large areas and were characterized by uneven burning patterns that resulted from the mosaic pattern of stand structure. Past burn mosaics increased the probability that subsequent fires would also burn in a mixed pattern (Brown and Smith 2000).

Table 3-17
Historic Fire Regimes

Regime	Frequency and Severity
I	0–35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced).
II	0–35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).
III	5–100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced).
IV	35–100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).
V	200+ year frequency and high (stand replacement) severity.

Source: Hardy et al. (2001) and Schmidt et al. (2002)

Prior to aggressive fire suppression, wildfires of variable intensity and severity periodically occurred. Stand-replacement fires, especially in the cool Douglas-fir and subalpine fir types were the norm under pre-settlement conditions.

Fire suppression is the most extensive cause for departure from the historic fire regime. However, other causes include invasive species (e.g. weeds, insects, and diseases), management activities affecting forest composition and structure (e.g. large trees removed in a frequent surface fire regime), and grazing.

Current Wildland Fire Management

Table 3-18 outlines the Fire Management Zones and their predominant Fire Management Categories in the Fire/Fuels Management Plan.

Current policy is to control all wildfires burning on or threatening public land within the first burning period. Modified suppression areas were established based on consideration of the following criteria:

- Values at Risk.
- Fire behavior.
- Fire occurrence.
- Beneficial fire effects, including but not limited to a reduction of fuel loading.
- Fire suppression costs.
- Consistency with other agency plans and policies.

Wildland Fire History

According to the Butte Field Office Fire Management Plan, there were 194 reported wildland fires between 1980 and 2003, of which 53 percent were human-caused. Local fire departments (non-federal) may or may not report wildland fires to the BLM. An average of eight fires burned an average of 1,348 acres per year (USDI-BLM 2004f).

Direction for fire and fuels management needed to protect other resource values and broad levels of treatment over 10 years, as described in the Fire/Fuels Management Plan are shown by category in **Table 3-19.**

Table 3-18
Fire Management Zones

Fire Management Zone[1]	Category	FMZ Acres[2]	BLM Acres in FMZ[2]
1. Absoraka Foothills	C	67,700	3,900
2. Big Belt Mountain	C	360,300	7,200
3. Big Hole River Corridor	C	68,800	11,100
4. Blackfoot (See Missoula Field Office)	C	340,800	0
5. Boulder River	B	264,400	14,300
6. Clancy/ Marysville	C	299,600	28,200
7. Elkhorn Mountains	C	482,900	68,900
8. Fleecer Mountain	C	284,300	18,100
9. McCartney/ Rochester	C	273,600	28,100
10. North Hills	B	33,900	6,300
11. Pipestone	C	369,300	41,000
12. Scratchgravel Hills	B	126,900	7,900
13. Sleeping Giant/Sheep Creek	C	82,600	20,500
14. Spokane Hills and North	B	156,500	6,800
15. Three Forks	C	485,000	31,200
16. Wise River Townsite	B	10,100	1,400
17. Bozeman/ Livingston Scattered Tracts	A	1,714,300	7,300

Source: USDI-BLM 2004b
[1] Category and associated treatments only apply to BLM land within each zone.
[2] Acres are approximate.

Table 3-19
Fire Management Categories

Category A	Category B	Category C	Category D
Description			
Fire is not desired at all (8,000 acres).	Unplanned fire is likely to cause negative effects (81 million acres).	Fire is desired to manage eco-systems, but current vegetative condition creates constraints on use (252 million acres).	Fire is desired; no constraints on its use (200 acres).
Fire Management Activities			
Mitigation and suppression required. Fire should not be used to manage fuels.	Suppression required. Fire and non-fire fuel treatments may be used	Suppression may be required. Fire and non-fire fuel treatments may be used	Suppression may not be necessary. Both fire and non-fire treatments could be used
Rationale for Categorization			
Direct threats to life or property. Ecosystems not fire dependent. Long fire return intervals.	Unplanned ignitions would have negative effects on ecosystems unless mitigated	Significant ecological, social, or political constraints	Few ecological, social, or political constraints. Less need for fuels treatment.
Fire Suppression Considerations			
Emphasis on prevention, detection, and rapid suppression response and techniques.	Emphasis on prevention/education and suppression.	Emphasis on reducing unwanted ignitions, resource threats, and fuels accumulations.	Emphasis on using planned and unplanned wildfire to achieve resource objectives.
Multiple Fire Priority[1]			
Highest	**High**	**Medium**	**Lowest**
Anticipated type and level of fire/fuel treatments, including treating areas that were previously treated:			
<1,000 acres mechanical	105,000 acres prescribed fire 74,000 acres mechanical 37,000 acres chemical weed treatment	192,000 acres prescribed fire 84,000 acres mechanical 149,000 acres chemical weed treatment	2,000 acres fire use or prescribed

Source: H-1601-1 Land Use Planning Handbook (USDI-BLM 2005a) and IM No. 2002-034
[1]If multiple fires were burning, Categories A and B would generally receive priority for fire management resources.

CULTURAL RESOURCES

Currently in the Butte Field Office there are 1,174 historic properties. Of these, 538 are prehistoric sites, 506 are historic sites, eight contain both prehistoric and historic components, and 130 sites on private land were recorded due to the effects of federal projects. In addition, 63 sites have been determined to be eligible for listing on the National Register of Historic Places, and 65 sites that have been determined not to be eligible for listing. The Butte Field Office has two historic properties listed on the National Register: the Crow Creek Ditch-and-Flume System, and the McCormick Feed and Livery sign. The Butte Field Office boundaries host segments of two national trail systems; the Lewis and Clark National Historic Trail, and the Continental Divide National Scenic Trail.

Cultural Resources managed by BLM are assigned to one of six Use Categories, summarized as follows:

Scientific Use Applies to any cultural property determined to be available for consideration as the subject of scientific or historical study at the present time, using currently available techniques.

Conservation for Future Use This category is reserved for any unusual cultural property which, because of scarcity, a research potential that surpasses the current state of the art, singular historic importance, cultural importance, architectural interest, or comparable reasons, is not currently available for consideration as the subject of scientific or historical study that would result in its physical alteration.

Traditional Use This category is to be applied to any cultural resource known to be perceived by a specified social and/or cultural group as important in maintaining the cultural identity, heritage, or well being of the group.

Public Use This category is applied to any cultural property found to be appropriate for use as an interpretive exhibit in place, or for related educational and recreational uses by members of the general public.

Experimental Use This category is applied to a cultural property judged well-suited for controlled experimental study, to be conducted by BLM or others concerned with the techniques of managing cultural properties.

Discharged from Management This category is assigned to cultural properties that have no remaining identifiable use.

Complete Use Category definitions are located in **Appendix K – Cultural Resources**, subsection .42; A-F.

Prehistoric Sites

Prehistoric sites from each of the cultural periods identified for the Northwestern Plains region have been documented in southwest Montana. The oldest occupations in the PA come from the Paleo-Indian period, about 12,000 to 8,000 years ago.

An increase in occupational intensity during the Middle Plains Archaic (ca. 5,000–3,100 Before Present [B.P.]) is evidenced by comparatively frequent occurrence of projectile points diagnostic of the McKean technocomplex. This increase in prehistoric use is punctuated during the Late Plains Archaic (ca. 3,100–1,400 B.P.). Corner-notched Pelican Lake-type projectile points are more profuse than any other single diagnostic point style identified in southwestern Montana (Davis *et al.* 1980; Deaver and Deaver 1986; Foor 1994). The Late Prehistoric Period (ca. 1,400–200 B.P.) is also represented, corresponding with an era of increased moisture and resultant improved habitat conditions for buffalo and other large ungulates (Bryson *et al* 1970; Fredlund 1979). Side-, corner-, and tri-notched arrow points, characteristic of the "Old Women" type, commonly occur in association with open camps, communal kills, lithic workshops, and as isolated finds (Davis *et al.* 1980; Taylor *et al.* 1984; Deaver and Deaver 1986).

While occupational intensity varied through time, site patterns appear to have remained relatively constant. The majority of prehistoric sites, regardless of their age or apparent cultural affiliation, can be classified into one of seven types based on their suspected functions or the presence of unique attributes. The types include: 1) lithic scatters, 2) habitations, 3) stone cairns and alignments, 4) toolstone quarries, 5) hunting sites, 6) rock art and ceremonial sites, and 7) trails.

Lithic scatters are the most commonly identified sites. They consist of concentrations of waste flakes and occasionally cores and complete or broken tools. Lithic scatters may reflect a range of functional activities, from the initial reduction of locally obtained toolstone to the production of formal tools such as projectile points or scrapers. While some lithic scatters may mark the former locations of prehistoric camps, the absence of domestic artifacts and features suggests that they generally represent brief, intermittent occupations. This site type is pervasive throughout southwest Montana and occurs in nearly all environmental settings. Deaver and Deaver (1986) found that of the 199 sites recorded in the Decision Area within Broadwater, Deer Lodge, Gallatin, Jefferson, Park, and the southern half of Lewis and Clark Counties prior to 1986, 121 (61 percent) are lithic scatters.

Habitations are the second most common prehistoric site type in southwest Montana. They range from small, briefly occupied field camps to expansive base camps containing features attributable to multiple extended-family groups. These sites typically have evidence of hearths (fire-cracked rock concentrations), and artifactual remains of food processing and/or preparation. The remains of residential structures are occasionally apparent and may consist of natural land form features, such as rock shelters, or purposefully constructed dwellings. In general, researchers believe that the stone rings found

at some habitation sites were used to hold down the covers of tipis.

Stone cairns and alignments occur in a wide range of environmental settings in southwest Montana, and many have been recorded in the Planning and Decision Areas. Individual features take a range of forms and based on their landscape position, it is occasionally possible to determine site functions. Linear arrangements of cairns often designate prehistoric trails or may have functioned as drive lines for communal kills. Isolated features or small groups of cairns located on prominent ridge lines or mountain crests may mark vision quest sites or other ceremonial activities.

Toolstone quarries are areas where prehistoric peoples obtained raw materials to be used for the manufacture of stone tools. Quarries are associated with exposures of fine-grained glassy rocks such as chert, chalcedony, quartzite, and vitreous basaltic stone.

Hunting Sites represent areas where groups of people worked collectively to force small herds of ungulates - including bison, pronghorn, and bighorn sheep - into preselected kill areas. Communal kills are the best documented of the prehistoric hunting sites in southwest Montana. Often the animals were herded over cliffs, where the fall killed or maimed them. In other cases, brush or pole enclosures were constructed and once animals were herded inside they were killed using projectiles or blunt instruments. Communal kills generally contain dense animal bone deposits, as well as associated projectile points and meat/hide processing tools. Kill sites usually occupy lowland settings along major rivers or streams that provide topographic features favorable for herding and containing/killing animals. Small numbers of sites representing this type have been recorded within PA (Scarborough 1975; Deaver and Deaver 1986).

Hunting blinds are another type of prehistoric hunting site known to exist in southwest Montana, including the Decision Area (Kiely, pers. comm. 2003). A hunting blind typically is found near a game trail or watering spot, and usually appears as a crescent-shaped rock. They were built and used by prehistoric people to lay-in-wait in order to ambush game.

Rock art and ceremonial sites represent highly personal cultural manifestations that are oftentimes inter-related. In southwestern Montana, rock art sites consist entirely of pictographs—images that are painted on rock faces, boulders, or other outcrops. They typically appear as monochrome panels with simple line drawings of human figures, animals, tally marks, and geometric designs. Rock art sites often occupy vertical bedrock faces that form narrow canyons at the mouths of tributary streams (Greer and Greer 1998).

Trails used by prehistoric people originally linked all the major valleys and ridge line systems in southwestern Montana. Few however, have been documented, in large part due to modern alterations to their associated features. The Old North Trail and the Indian Creek Trail are two examples of routes used by prehistoric people in Montana. There is no consensus about the locations of these trails, however.

Historic Sites

Mining-related sites are the most common historic sites in the PA. These sites span from the period from the early 1860s to after World War II, and many retain evidence of more recent development. Site complexity ranges from individual prospect pits and test trenches to concentrations of adits, shafts, waste-rock dumps, and remains of industrial structures such as mills. Placer mining sites also exist in the PA and almost universally are identified by accumulation of placer tailing (man- or machine-made piles of gravel) along a creek or river. A placer mine is often accompanied by a network of ditches and dams. Residential buildings in various states of decay and other domestic features can be found at both lode and placer mine sites. The PA also contains remnants of towns (in various states of decay) that appeared in response to the residential, commercial, and social needs of miners and their families. The bulk of the larger and/or complex mine sites and towns are on private rather than public land (McDaniel 1975; McCormick and Quivik 1991; Park 1993a; Park 1993b; Sanders 1993; Sanders 1996; Peterson and Melhs 1996; Rossillon 1997; Travis 1997a; Travis 1997b; Sanders and Walker-Kunz 1998; Fairchild and Horstman n.d.a; Fairchild and Horstman n.d.b).

Most mining-related sites lie within districts, organizational frameworks historically imposed over a fairly concentrated area of mining activity. Historic mining districts all or partly within the Decision Area include Austin, Boulder, Clancy, Colorado, Confederate Gulch High Ore Creek, Marysville, McClellan/Mitchell, Melrose, Indian Creek, Pipestone, Radersburg, Scratchgravel Hills, Stemple, Whitehall, and Winston. Most of these districts have been minimally recorded to date. The great copper mining and smelting complex of Butte-Anaconda is also within the PA. Unlike most other mining districts in the area, it has been subject to intensive inventory.

Agricultural-related resources are the second most common historic site type documented in the PA. Due to the region's short growing season, large farmsteads and/or homesteads are rare, especially in comparison to much of eastern Montana. Raising livestock rather than cultivation of crops (other than hay) dominated the region's agricultural development. Cattle and sheep ranches and dairy farms tend to be widely scattered in favorable areas such as along streams and near upland springs, and with few exceptions are located on patented (i.e., private) rather than public land. A variety of site types which historically played ancillary roles in ranching/farming operations have been documented within the Decision Area. The most prevalent of these site types are

dams and ditches, cow camps, sheep camps, line shacks, and isolated corrals (Davis *et al.* 1980).

Several historic roads and railroad lines also exist in the PA. Road and railroad alignments are mostly confined to private land and, in the case of roads, state-owned land. Similar to agricultural properties, sites secondary to the development and/or use of a road or railroads have been identified in the Decision Area. To date these include construction camps and signs. Some of the other more common historic properties known to exist in the PA are timber camps and sawmills, and remnants of trails and/or wagon roads. A few isolated graves and an airplane crash site have been recorded in the Decision Area (Stoner 1981; USDI-BLM 1983; McCormick 1997).

Several of the known cultural resource sites in the Decision Area have been determined eligible for listing in the National Register of Historic Places. Of these, however, only two sites have been listed.

Paleontological Resources

Paleontology is a discipline that combines biology and geology in the study of fossils. Fossils are paleontological resources that include the body remains, traces, or imprints of plants or animals that have been preserved in sedimentary deposits during past geologic or prehistoric times.

Fossils and fossil-bearing deposits occur in Paleozoic, Mesozoic, and Cenozoic rocks throughout the PA, and range in age from 600 million years to recent. Important fossil resources within the PA focus on vertebrate fossils that are of scientific interest from a variety of points of view (for example: dinosaur skeletons, nests and eggs, turtle remains, or horses and camels). Most of these vertebrate fossils occur in Cenozoic Era rocks, from the Paleocene to the Pliocene, approximately 65 million to 1.6 million years ago. In the PA, the Cenozoic fossils come mostly from Eocene and Miocene epochs. These strata are most well known for containing horses and camels.

Paleozoic and Mesozoic sediment (deposited 600 million to 65 million years ago) in the PA most commonly contain marine invertebrates, although non-marine invertebrates, fish and reptiles occur as well. Within these various sedimentary units, fossil density and occurrence ranges from sparse to abundant. Some individual sedimentary beds are composed of predominantly fossil and shell fragments (fossiliferous), while others may rarely contain fossils. The Madison, Kootenai, and Morrison formations are important stratigraphic units that contain these fossils (Davis *et al.* 1980). The stratigraphic section has been described in some detail by Freeman and others (1958) and Klepper and others (1971). Their work indicates which sedimentary units contain fossils, the most commonly observed fossil types, and occasionally provide an indication of the fossil density or abundance. Exposures and fossil occurrences in the Paleozoic and Mesozoic stratigraphic units of the PA are similar to those found commonly across southern Montana and are, therefore, not considered to be either unusual or unique (Davis *et al.* 1980).

GIS analysis for the PA shows that only three fossil specimens have been recorded as flying reptiles; seven fossil specimens have been terrestrial dinosaurs; 61 specimens have been marine reptiles, and 189 specimens have been fossil mammals. By far the most productive formations are Tertiary sedimentary rocks and sediments. The largest collection of recorded paleontological localities (60) is located in Jefferson County, containing mixed specimens of mammals and marine reptiles. But while Jefferson County has the largest number of recorded fossil localities and specimens, no terrestrial dinosaurs are included in those known localities.

Visual Resources

The visual resource inventory includes a general discussion regarding VRM Classes. Under the current Headwaters RMP, specific VRM Classes were assigned to areas characterized by high visual resources (river corridors and Wilderness Study Areas). All other public land was not designated a specific VRM Class until a project occurred in that area. At that time, VRM Classes were assigned according to BLM's VRM Handbook.

VRM Class I was assigned to WSAs. Management practices within this class must not be noticeable by the casual observer.

VRM Class II was assigned to special recreation areas or Areas of Critical Environmental Concern and some river corridors. VRM II allows for minimal visual disturbance from management activities that should be indiscernible to the casual observer.

VRM Classes have been assigned to some land based on specific project plans within the PA since 1983. VRM Classes consider special management areas, key observation points, scenic quality, distance zones, and sensitive areas.

RESOURCE USES

Forest and Woodland Products

Table 3-20 summarizes the commercial forest land acres. The Decision Area contains 87,797 acres of commercial forest land. Under current BLM policy (BLM Manual 5251.11), forest and woodland stands are classified as commercial forests when they are producing or capable of producing at least 20 cubic feet of wood per acre per year of commercial tree species. The predominant commercial species are Douglas-fir, lodgepole pine, and ponderosa pine, with minor amounts of subalpine fir and spruce.

Table 3-20 Summary of Forested Acres in the Decision Area	
Designation	**Acres**
Total Forested Acres (CFL + woodland)	110,350
Commercial Forest Land (CFL)	87,797
Suitable CFL	82,815
Nonsuitable CFL	4,982
CFL Set Aside for Wildlife[1]	8,035
CFL Set Aside for Recreation	7,076
CFL Set Aside for Wilderness Recommendations	7,939
Total CFL Set Aside	28,032
Total Available Base (Suitable CFL-Total CFL Set Aside)	54,783
TPCC Restricted Base[2]	42,650
Non-restricted Base (Total Base Restricted Base)	12,133
Allowable Cut (million board feet per decade)	27.21
Miles of Road Construction (Miles of Permanent road per decade)	55
Acres Cut per Decade (@ 3 thousand board feet per acre)	9,069

CFL = Commercial Forest Land

TPCC = Timber Production Capability Classification

[1] Set Aside – Forest areas that have been removed from general forest management and the use of silvicultural techniques to meet forest production goals.

[2] TPCC Restricted Base – Forest areas where specific silvicultural treatment methods and/or techniques may be restricted on a case-by-case basis to prevent or mitigate specifically identified resource impacts.

The forested acres have changed since 1984 due to a change in the Decision Area boundary and several large land exchanges.

Approximately 5,169 acres of forested public land in the PA has been treated by forest management since 1984. The majority of forest treatments were selective harvests in mature stands. Nearly half of the acres (2,052 acres) treated since 1984 where forest salvage and restoration planting treatments on a portion of the 5,178 acres of commercial forest burned by wildfires in 2000. Wildfire suppression has kept forest structure changes from wildfire to less than one percent of all disturbances.

Approximately 60 to 80 percent of the forest land effected by the larger wildfires in the Decision Area were completely consumed by stand replacement fire intensities, potentially resulting in a quarter to half of the area considered to be deforested as very little seed source remains for natural regeneration.

An estimated 29,000 areas of conifer colonization of grass-shrub vegetation types has occurred over the last several decades with similar conifer establishment problems developing in the open forest types, dry forest meadows and woodlands that have become heavily overstocked by young conifer trees as well, converting stands to high fuel loadings and closed canopy conditions, particularly in the WUI.

In the 1984 Headwaters RMP estimated resources could support an annual allowable cut of 2.6 to 2.9 million board feet. The estimate amounted to an average of 867 acres per year or a total of 17,333 acres over the 20 years since the 1984 plan was established.

There are 22,553 acres of woodland, which are forest communities often occupied by noncommercial species such as limber pine, juniper, mountain mahogany, or quaking aspen, and are often accompanied by Douglas-fir and ponderosa pine. **Table 3-21** presents a summary of forested woodland acres by county.

Table 3-21 Summary of Woodland by County, Butte DA	
County	**Current Woodland Acres**
Beaverhead	271
Broadwater	4,935
Deer Lodge	18
Gallatin	409
Jefferson	9,139
Lewis and Clark	5,570
Park	506
Silver Bow	1,705
Total	**22,553**

LIVESTOCK GRAZING

Of the approximately 307,309 acres of public land in the PA, 273,039 acres are managed as part of 237 grazing allotments ranging in size from 4 acres to 13,118 acres. Thirteen allotments are currently vacant. Seven allot-

ments are managed by other BLM or USFS offices. The number of allotments grazed by cattle, horses, and sheep is 210, 5, and 3 respectively, with three additional allotments grazed by both cattle and sheep and one grazed by both horses and sheep. Resource allocation within an allotment is based on AUMs (the amount of forage needed to sustain one animal unit, or its equivalent, for one month). AUMs required for livestock are based on the nutritional needs specific to each livestock class. The domestic livestock permitted to graze on allotments in the PA includes cattle (24,139 AUMs), sheep (1,286 AUMs), horses (240 AUMs), and buffalo (12 AUMs). **AMS Table 2-15** displays allotment information in a tabular form. **AMS Figures 2-13a, 2-13b and 2-13c** show the grazing allotments in the PA.

Grazing Permits and Leases

The following Affected Environment discussion is based upon the grazing regulations and guidance in effect at the time the RMP was published. New regulations with a few legally challenged exceptions become effective August 11, 2006.

Grazing preference or preference is defined as a superior or priority postion against others for the purpose of receiving a grazing permit or lease. Grazing use in the allotment is authorized through issuance of grazing permits or leases. The permits and leases and attendant activity plans describe the livestock class, intensity, duration, and timing of grazing as well as fences, water developments, and other range improvements to be installed. BLM analyzes effects of proposed grazing according to the NEPA process and prepares an Environmental Assessment (EA) prior to permit issuance or renewal. Most permits and leases are valid for a period of 10 years.

Details of management may be incorporated into an Allotment Management Plan that becomes part of the lease or permit. These plans include grazing instructions specified to meet resource condition, sustained yield, multiple uses, economic, and other objectives. In the PA, the trend is to focus more on reviewing management during the rangeland health evaluation process rather than to develop new plans (Thompson, pers. comm. 2004a). Currently, 41 of the 226 allotments (18 percent) have approved Allotment Management Plans. Five of these are Coordinated Resource Management Plans (CRMPs) developed in conjunction with USFS land in the PA.

The BLM authorizes permittees to use the land for grazing by establishing an allocated amount of forage a permittee may graze on an allotment (this is referred to as "active use"). A permittee may enter temporary nonuse status when operators do not wish to graze for financial, operational, or related reasons or where resource conditions do not allow for grazing. Alternatively, if excess resource is available as a result of favorable weather and good growth conditions, the BLM may temporarily authorize the permittee to graze in excess of the established level of use. If the permittee chooses to allow another operator to graze livestock on their permitted allotments livestock control agreements must be filed with and approved by the Authorized Officer.

Range Health Standard Assessments

The conditions of resources on each allotment are determined through assessment and monitoring. From these assessments, the potential impacts of grazing are evaluated in the context of standards for rangeland health and guidelines for grazing administration. A BLM interdisciplinary team evaluates allotments in accordance with established rangeland health standards and guidelines. Standards are descriptions of the desired condition of the biological and physical components and characteristics of rangeland. Guidelines are management approaches, methods, and practices that are intended to achieve a standard.

Allotment evaluations include identification of factors influencing the condition of the resources. Where current grazing management practices or levels of grazing use on the public land are a significant factor in failure to achieve rangeland health standards, BLM has until the next grazing season to start implementing corrective actions.

Such actions may include adjustment to grazing duration, timing, intensity, forage utilization, or installation or implementation of range improvement projects. Permittees, interested publics and other agencies are consulted and actions are analyzed according to the NEPA process prior to implementation of corrective actions. To date, 110 allotments have been assessed as to whether they meet Land Health Standards.

Permanent monitoring points established in accordance with the objectives of the 1984 RMP planning effort are used to evaluate upland and riparian sites throughout the PA. Upland monitoring stations are located in key areas and include transects assessed using Daubenmire's method of ocular plant cover estimation and photo points. Riparian areas and wetlands are primarily monitored using cover board photo points (Thompson, pers. comm. 2004a). The trend observed in long-term monitoring of these locations is used to assess the health and condition of these areas and provide a basis for adjusting management, including grazing, as appropriate.

Range Improvement Projects

Range improvements are installed and projects are implemented to improve condition or facilitate management of resources. In the PA, most range improvements consist of items such as fences, wells, and spring developments. Fences are used to keep livestock of various permittees' separate, control the season of use, and exclude grazing from selected areas. Water improvements help improve distribution of livestock and alleviate pressure on natural water sources such as streams and wet-

lands as well as providing water for some species of wildlife. Other range improvement projects such as prescribed burning are used to produce an immediate change in vegetative or environmental conditions that will lead to improved rangeland health or utility.

Range improvements can be authorized on public land under a Cooperative Range Improvement Agreement or Range Improvement Permit. Cooperative Range Improvement Agreements are used to authorize permanent structural improvements such as reservoirs. Range Improvement Permits only authorize installation of removable improvements such as livestock handling facilities. Proposed projects funded by BLM are prioritized based on evaluation of the need and costs as they relate to expected benefits. All improvements are constructed according to BLM standards and specifications.

Prohibited Acts

Permits or leases and preference may be cancelled and civil penalties may be applied as a result of grazing rules violations. The BLM is responsible for monitoring use on the land it administers.

Factors Influencing Grazing

A variety of environmental, economic, and social factors weigh heavily in planning decisions related to livestock grazing in the Decision Area. Grazing management is adjusted during renewal of permits and leases and at other times as appropriate in response to these factors. Site-specific factors influence management to a more notable degree, but the following factors influence grazing management in each of the management areas.

Wildlife Habitat

One objective of allotment management is to maintain and, where possible, enhance wildlife habitat. Protection of federally listed species and species of special concern occasionally requires intensive management that is sensitive to the wildlife needs. In addition, maintaining available forage for big game animals, especially on winter range, can conflict with livestock grazing. Livestock grazing is adjusted as appropriate to ensure wildlife habitat requirements are taken into account in accordance with the 1984 Headwaters RMP.

Riparian Areas and Wetland

Riparian and wetland areas are integral to maintaining many ecosystem processes and maintaining their health and function is a high priority. Succulent vegetation, shade, and water are often associated with these areas. Issues related to riparian and wetland conditions are a dominant factor driving changes in allotment management. While most upland communities meet condition and health standards, riparian areas frequently are in need of more intensive management to improve conditions. During review of grazing leases and permits, appropriate management tools and guidelines for grazing management options are considered and prescribed as necessary to improve the condition of riparian and wetland areas (Thompson, pers. comm. 2004b).

Noxious Weeds

Noxious weeds effectively compete against native vegetation for resources and continue to expand in the PA. These weeds are unpalatable to most classes of domestic livestock and their expansion reduces the amount of available forage. Control of noxious weeds is an integral part of allotment management.

Forest Encroachment

Encroachment of forests onto areas traditionally managed as rangeland impacts utility of the area for use by livestock by reducing herbaceous productivity and forage availability. As forest stands colonize rangeland, palatable species are replaced by woody species and sparse understory vegetation. The reduction in available forage reduces the carrying capacity (AUMs) of the area, thereby restricting livestock grazing until such time as rangeland vegetation is allowed to reestablish. This reduction in forage also increases livestock and wildlife conflicts as they compete for the same resource.

Urban Interface and Recreational Conflicts

Subdivisions and land purchased for recreational purposes has an effect on allotment management and grazing. Frequently, private land next to or near allotments is sold to private citizens not engaged in the livestock business. The change in land use adjacent to public land directly influences the use of public land. Increased recreational use, increased public awareness of livestock use, and improved access often result in conflicts.

MINERALS

Mineral uses are divided into four categories based on laws regarding their disposition:

- Leasable fluid minerals, which includes oil and gas, coal bed natural gas (methane), and geothermal resources;
- Leasable solid minerals (coal);
- Locatable minerals (metals, some limestone and building stone); and
- Salable minerals (sand and gravel, some limestone and common varieties of flagstone).

Leasable minerals are defined under the Mineral Leasing Act (February 1920; 43 CFR 3000-3599, 1990) and include: coal, phosphate, oil, oil shale, gas, sodium, native asphalt, and solid and semi solid bituminous rock. In more recent years, potash and geothermal resources, and sulphur in New Mexico and Louisiana, were added to minerals that are considered leasable. The rights to these minerals on public land may only be acquired by

competitive leasing. In the discussion below, leasable minerals are divided into fluid and solid.

Locatable minerals are minerals for which the right to explore or develop the mineral resource on federal land is established by the location (or staking) of lode or placer mining claims and is authorized under the General Mining Law (May of 1872). Locatable minerals include metallic minerals (gold, silver, copper, lead, zinc, molybdenum, uranium, etc) and non-metallic minerals (fluorspar, asbestos, talc, mica, limestone, etc).

Salable minerals were designated under the Materials Act (July 1947), which authorizes the disposal of petrified wood, and common varieties of sand, stone, gravel, pumice, cinders, and clay through a contract of sale or a free use permit. Uncommon varieties of these same minerals are locatable.

Much of the information provided in this section regarding the potential for mineral resources in the PA is derived from the Butte Field Office Mineral Potential Report (Kirk 2005).

LEASABLE FLUID MINERALS

Oil and Gas

There are no producing oil and gas wells in the Butte Field Office. Recent activity within the BFO includes 14 dry holes drilled since 1983. (If no economically producible oil or gas is discovered, a well is called a "dry hole"). One well has been drilled to total depth in Park County and another spud in. The first well is to be tested in the fall of 2007. By 1982, much of the BFO had been leased. However, as leases expired, very few leases were issued after 1988. Currently there are 98 authorized federal oil and gas leases (including Forest Service minerals) within the Planning Area (PA) covering 143,739 acres. In addition, approximately 37,732 acres are covered by suspended lease nominations, pending completion of this RMP.

With respect to oil and gas resources, the Butte Field Office is partially within the Rocky Mountain (Montana) Overthrust Belt and partially within the Southwest Montana Province (USGS 1995; Perry 1995a-b). Both areas are considered highly prospective for oil and gas. Both source rocks abundant in organic carbon and porous reservoirs exist in the Paleozoic stratigraphic section. Faults and folds related to these structural provinces have produced structural traps for oil and gas. The historically productive Central Rocky Mountain Foreland Province lies to the east of the Rocky Mountain Overthrust Belt and immediately to the north and east of the PA.

Knowledge of the existing geologic setting for oil and gas resources in the PA is based on bedrock geologic mapping, geophysical data, and the 110 dry oil and gas wells drilled in the general area of the PA (**AMS Figure 2-2**). While 110 wells may seem like many tests, only 37 of those wells were drilled to a depth of 5,000 feet or more. Only 21 of those deep tests were located within the boundaries of the Butte Field Office. The wells shallower than 5,000 feet did not adequately test the area.

Occurrence and Development Potential

To provide guidance to planners on possible future oil and gas activity, the BLM uses a two stage mapping process, called: 1) occurrence potential; and 2) development potential mapping (USDI-BLM 2004a). Occurrence potential is a measure of the likelihood of an area to contain oil and gas, regardless of current economics and current accessibility to the area. Development potential is the current estimate of the probability that oil and gas drilling will occur in the future. Both types of mapping are dynamic and can change as new data becomes available. In frontier areas like southwest Montana where drilling is sparse, one deep test or discovery well can rapidly change the occurrence and development potential of an area.

The following factors are evaluated when creating occurrence potential maps:

- The existence (or lack) of USGS designated oil and gas plays,
- The thickness of the sedimentary rock package, the existence (or lack) of producing oil and gas fields,
- The presence (or lack) of buried source rocks with the potential to generate hydrocarbons,
- The presence (or lack) of reservoir rocks (the hydrocarbon "sponge"), and
- The presence (or lack) of adequate hydrocarbon seals and traps.

The USGS has used "play analysis" in the preparation of their national oil and gas assessments. A play is a set of discovered or undiscovered oil and gas accumulations that exhibit nearly identical geological settings and characteristics. Therefore, a play is defined by the geological properties responsible for the real or potential accumulations of oil and gas resources. In the USGS assessments, only oil and gas accumulations of at least one million barrels of oil (MMBO) or six billion cubic feet of gas (BCFG) are considered when plays are defined and assessments of significant resources are made. In the national USGS analysis about 700 plays are grouped into 72 provinces that, in turn, are grouped into eight regions. This PA covers parts of two provinces, the Montana Overthrust and Southwest Montana Provinces and contains all or parts of ten plays. Seven of the plays are hypothetical because there has been no production associated with the plays and three of the plays are confirmed as there has been some historical production, but not within the PA.

The potential for occurrence of oil and gas in the Butte Field Office PA has also been classified by BLM staff geologists and summarized in the mineral report prepared for this RMP. Occurrence potential is shown for

the entire PA on **Figure A-1** in **Appendix M – Fluid Minerals**, including congressionally designated wilderness areas, since the occurrence potential is based solely on geology, which continues beyond the wilderness boundaries. Areas classified as having a high potential for occurrence of oil and gas are reserved for proven oil and gas producing provinces. There are no areas of "high" oil and gas occurrence potential in the PA. This is because of the distance to the nearest producing field. Moderate occurrence potential means an area with an apparent unmetamorphosed sediment thickness above the Precambrian Archean basement rocks of 2,500 feet or more in a currently non-productive province and containing probable source rocks and reservoir beds. Low occurrence potential areas were classified using two slightly different standards. Under the first, they are areas having sediments with less than 2,500 feet of thickness or those areas with insufficient evidence to learn the thickness of the sediment. Under the second standard they are areas with 1,000 to 3,000 feet of sediment cover over the Pre-Cambrian rock. Those areas with very low occurrence potential are primarily:

- Precambrian outcrops,
- Highly metamorphosed areas that are not proven overthrusts with a section of sediments likely below the thrust sheets, or
- Large areas of outcrop of younger intrusive rocks (i.e., the Boulder Batholith, between Helena and Butte).

Reasonably Foreseeable Development

At the time the 1984 Headwaters RMP was prepared, little additional leasing was anticipated to take place because most available leases had already been acquired under existing established leasing regulations with appropriate stipulations for special conditions. It was also anticipated that a relatively large number of permits to drill might be sought, given the accelerated level of exploration activity that was being driven by economic conditions at the time and relatively new discovery of prospects for deep structurally trapped oil in the Montana Overthrust Belt. Laws, regulations, and rules were in-place to provide guidance with these leasing and permitting activities. It was anticipated that oil and gas drilling would be a part of the foreseeable future of resource development within the PA.

Despite the flurry of exploration activity in the Montana Overthrust Belt in 1983, the only two areas of oil and gas production were in Teton and Pondera Counties, east of the Rocky Mountain Front in areas are no longer within the PA.

The Reasonably Foreseeable Development (RFD) scenario is an estimate of oil and gas activity expected because of resumed oil and gas leasing in the PA. The scenario is hypothetical in that drilling may occur anywhere in the PA where an oil and gas lease allowing surface occupancy is issued. Actual drilling proposals that result from leasing, if any, will likely differ in location from those anticipated by this RFD scenario. It is also possible that leasing could result in either more or fewer drilling proposals than presented in the scenario. A summary of the RFD scenario prepared for this RMP follows.

Four areas were identified during preparation of the RFD scenario as having the highest potential for conventional oil and gas exploration and drilling activity in the Planning Area. Each of the four areas is associated with one or more play areas defined by the USGS. These areas are further described and also mapped in **Appendix M** of this document. Area #1 is referred to as the "Southern Deerlodge Valley Basin Area". This area occurs in the southernmost portion of a fault bounded Tertiary-aged basin that is located in the Deerlodge Valley. Area #2 is referred to as the "Imbricate Thrust Zone". The area occurs both to the north and east of Helena, Montana, in a sequence of sediments that are thick and structurally thickened by imbricate thrust faulting associated with the Eldorado and Reff thrust faults. Area #3 is referred to as the "Helena Salient Gas Play Zone". This zone occurs over a very large area in the east-central portion of the Planning Area. Area #4 consists of the "Crazy Mountain Oil and Gas Play." This area occupies most of the northern portions of Gallatin and Park Counties in the easternmost portion of the Planning Area as a broad extensive area of potential oil and gas resources.

The Bill Barrett Corporation recently (May 2, 2007) initiated a four well drilling program in northern Park County within the Butte Field Office boundaries. The four locations are located in T. 4 N., R. 8 E. and T. 5 N., R. 8 E., None of the locations are located on Federal minerals. The first well in the program (the Draco #10-15, NW¼, SE¼, Sec. 15, T. 4N, R. 8E) to be spud in has reached total depth and it has apparently had production casing set (September 14, 2007, Rocky Mountain Oil Journal). The Press has announced that it will be tested in the fall of 2007. The second well is being drilled as this is written (October, 2007). For purposes of this RMP it is assumed by the BLM that two of the wells in this drilling program will be producing wells and that these two wells would each have two producing development wells drilled, one of which would be a federal well. The BLM has also assumed that these would be gas wells. This area has not been identified as an additional analysis area in **Appendix M** as the areas identified there are areas of forecast exploration activity. This area is an actual prospect that is being drilled. The BLM does not have detailed information on the prospect and does not wish to guess on its size and surface dimensions.

Based on the analysis in the RFD scenario, it was estimated that up to 19 conventional oil and gas wildcat wells (exploratory wells drilled in an area with no existing production) might be drilled in the PA in the next 15

to 20 years. Of these 19 wells, it is estimated that 13 would be "dry" holes. Dry holes would be plugged and abandoned with surface reclamation occurring shortly afterward. It is further estimated that six of the wells could be completed for production. Each of the discovery wells would probably prompt additional step-out wells. A "step-out well" is a well drilled adjacent to or near a proven well to establish the limits and continuity of the oil or gas reservoir or to assist with production. It was estimated that 12 step-out wells would be drilled, two for each discovery. For analysis purposes seven of the producing wildcat and step-out wells are assumed to be BLM.

Coal Bed Natural Gas

As the name suggests, coal bed natural gas resources are sources of natural gas that are intimately associated with coal deposits. The gas is generated by degradation of buried organic material as a byproduct of its conversion to coal by either thermal (burial) or microbial activity. Often the coal deposit is saturated with water; and the gas generated is typically trapped under pressure by groundwater within the coal beds. Drilling and relieving the water pressure allows the gas to be released from the coal bed aquifer.

There are very few significant coal deposits within the PA and therefore little potential for exploration or development of coal bed natural gas resources outside of the Trail Creek and Livingston coal-fields. In 2001, J. M. Huber Corporation applied for a permit to drill one coal bed natural gas well in the southeastern part of the PA, on private land. This proposed well would have targeted potential gas reserves possibly associated with the Trail Creek coal-field, near Bozeman Pass, east of Bozeman. These coal-fields are not located on BLM administered public land; however, the BLM does administer a small number of isolated tracts of split estate minerals in the Trail Creek coal deposit area. This permit to drill was granted by the State of Montana, but legal action involving Gallatin County and the formation of a local zoning district delayed drilling of the well. The permit to drill expired in January of 2003. This area is referred to as Area #5 in the RFD. This is an area on Bozeman Pass where an area of coal bed natural gas potential is associated with the coal deposit on the Pass.

It is anticipated that as many as 40 wells would be drilled for coal bed natural gas in limited and scattered areas of known sub-bituminous coal resources located in Gallatin and Park Counties; most likely in the Trail Creek Road area near Bozeman Pass (Livingston and Trail Creek Fields). It is envisioned that initially 16 exploration wells would be drilled, and that six of these would discover coal bed natural gas resources that would warrant the drilling of an additional 24 step-out wells to develop the resources. These would all likely be non-federal wells based on the small percentage of federal ownership in the area.

Geothermal Resources

Geothermal resources are naturally occurring heat sources that can potentially be used for heat or generating power. The structural geologic setting of the PA is ideal for development of geothermal resources. In addition, there is an extensive naturally occurring geothermal system developed around the Yellowstone volcanic center.

Geothermal resources are rated by temperature:

- Low temperature, less than 194° F;
- Moderate temperature, 194-302° F; and
- High temperature, greater than 302°F.

No high temperature geothermal resources have been identified in Montana. Although there are many known geothermal springs in the PA, only a small number of them have been developed commercially (for example, Chico Hot Springs, Bozeman Hot Springs, Fairmont Hot Springs, Broadwater Athletic Club, etc.), and none of those are on public land.

There are three Known Geothermal Resource Areas (KGRAs) on public land within the PA; Boulder Hot Springs, Corwin Springs, and Marysville.

The Boulder Hot Springs is a large KGRA located near Boulder, in Jefferson County. Temperatures are variable and low, and the resource is probably only useful for recreation, heating for buildings, or possibly agricultural use. Most of the outlying springs are only useful for recreational or small space heating.

The Corwin Springs KGRA is located along Highway 191 about seven miles northwest of Gardiner, in Park County, along the Yellowstone River near Yellowstone Park. Some interest was expressed in developing this geothermal resource for heating purposes in the early 1990s on private land. The proposal was somewhat controversial at the time, and in January 1994 a Water Rights Compact between the NPS and the State of Montana placed limits on the development of all water resources (and geothermal resources in particular), adjacent to Yellowstone Park in Montana (similar actions were taken in Idaho). The purpose of this controlled groundwater area is to protect the geothermal resources at Yellowstone National Park. This federally managed hot springs has not been offered for a lease sale.

The Marysville KGRA is located about 12 miles northwest of Helena, Montana. This geothermal resource was identified by anomalous geothermal heat flow and does not have any surface expression of a hot spring. Temperatures are moderate (around 100°C (212°F) and no useable resource was developed (1983). In 1997 a geothermal lease application was filed as a non-competitive offer and included land within the Marysville KGRA. Because it was a non-competitive lease offer within a designated KGRA, the BLM rejected the offer. After an appeal the lease offer was withdrawn.

The Boulder and Marysville KGRAs have been offered for lease sale in the past but have not had any bidders. There has been no recent interest in leasing any of the three areas.

Leasable Solid Minerals

Coal

In the southern part of the PA, the small Trail Creek, Livingston, and Electric (Gardiner) coal-fields, although historically mined, are still undeveloped. Historical underground production was small; production began in about 1870 and was completed by 1947, reaching a peak in about 1910. Although some production was used for heating purposes, most production was used in metal smelters and steam engine locomotives. Much of the coal was converted to coke for use in the smelters in hundreds of small coking ovens (Alt and Hyndman 1986). It is likely that significant underground reserves of coal remain in the area, but given the small size of the fields, their location with respect to recent rural residential development, and the fact that the coal needs to be mined from underground makes future development unlikely. Other sporadic undeveloped and sub-economic deposits of coal and lignite occur throughout the PA.

Phosphate

Extensive deposits of the Permian Phosphoria Formation have been historically mined from the Maiden Rock area south of Butte. Mining for phosphate here probably peaked in the early 1950s when the phosphate was used to supply an elemental phosphate plant at Silver Bow, west of Butte. These mines were underground mines and resulted in significant underground development. Activity here ceased in the 1970s. There are phosphate resources remaining both at the Maidenrock area and south and to the east, north of the Humbug Spires, but the development of the phosphate fields in Idaho, where the mines could be developed as open cut mines, has rendered these resources as uneconomic.

Locatable Minerals

Metals

Mineral deposits of gold, silver, copper, lead, zinc, and molybdenum are present within the PA (**AMS Figure 2-3**). Because of the unusually abundant mineral wealth in the Butte Field Office, this area contains some of the most famous mining districts in Montana, including: Butte, Corbin-Wickes, Basin, Scratch Gravel Hills, Marysville, Radersburg, Helena, Elkhorn, Boulder, Emigrant, Jardine, and New World.

Active metal mines in the PA include:

1. The Golden Sunlight Mine, an open pit gold mine northeast of Whitehall opened in 1981. The mine has operated continuously since then and is scheduled to close in approximately 2010;
2. Montana Tunnels Mine, an open pit polymetallic mine (lead, zinc, silver, gold) located west of Jefferson City opened in 1985 and is scheduled to close in 2011; and
3. Montana Resources Mine (the Butte mine), an open pit copper and molybdenum mine with associated silver and gold byproducts. Mines in the Butte area have operated more or less continually since the 1860s and this is the current pit, following on from previous open pits in the district, the Berkeley Pit and the Continental Pit. The mine has reserves that extend many years.

Limestone

Three active limestone mines are located within the PA. These mines process high-calcium limestone for chemical and industrial uses.

The Indian Creek Mine is on public land adjacent to and within the Montana Army National Guard's Limestone Hill Training Area, west of Townsend, in Broadwater County. A proposal by the Montana Army National Guard to withdraw the area from the public land laws, including the mining law, is currently in progress. A Legislative EIS has been prepared for Congress, which ultimately determines whether, and under what conditions, the withdrawal is granted. Under the Preferred Alternative the Montana National Guard would manage all resource uses except minerals, which would continue to be managed by the BLM. The Ash Grove Cement Company produces limestone from its Montana City Quarry. The Trident Mine, another limestone mine, is north of Three Forks, in Gallatin County.

Marble and Slate

A small marble quarry has been operated intermittently at the south end of the Limestone Hills area and west of Townsend. Marble from this quarry has been shipped internationally for use as pedestal and column bases.

Two slate building stone quarries are located in the PA. One is in Soap Gulch area near Melrose (south of Butte) and the other quarry, the Gates Stone Quarry, is located in Towhead Gulch. Another series of small open-cut mines or quarries in the Gardiner area have mined travertine for decorative building or ornamental uses. Operation of these quarries has been intermittent and they often reopen and operate to meet a specific demand.

Salable Minerals

The PA currently has three salable material operations on public land. Two sand and gravel pits are located in the Limestone Hills west of Townsend. One of the pits is inactive and the other pit is used by the Army National Guard for road surfacing material. The third, a community flagstone pit, is located near Montana City.

RECREATION

Recreation Opportunities

Recreational activities available within the Decision Area include big game hunting, upland bird and waterfowl hunting, fishing, mountain and road biking, camping, backpacking, horsepacking, river rafting, canoeing and kayaking, swimming, lake boating, downhill skiing and snowmobiling, OHV use, picnicking, archery, organic materials gathering, organized festivals, and viewing wildlife and landscapes. No Recreation Opportunity Setting classifications currently exist to guide appropriate levels of recreation experiences, services, and developments.

BLM land along the Madison, Big Hole, Jefferson, Missouri, and Yellowstone rivers, offer some of the most outstanding sport fishing opportunities in the United States. The State of Montana classifies many reaches of these streams as Class I or "blue ribbon" fisheries. In addition the Butte Field Office manages intensively used land and highly developed sites along Holter, Hauser, and Toston Reservoirs on the Missouri River.

Recreation Management Areas

Specific recreational resources in the Decision Area include five Special Recreation Management Areas, one Extensive Recreation Management Area (ERMA), and 49 developed recreation sites, seven of which are fee sites (**AMS Figures 2-24a, 2-24b, and 2-24c**). Fee collections at developed sites are used to maintain, operate, and improve facilities and services. An SRMA is an area where BLM prioritizes management efforts to provide specific recreational activities and opportunities (**AMS Figure 2-25).** These areas usually require higher levels of recreational management. An ERMA is an area not specifically designated as an SRMA and includes all BLM land outside the SRMAs where uses are generally dispersed and management primarily custodial. This extensive area includes the Continental Divide Trail, three popular OHV riding areas, and several developed recreation sites where both dispersed and concentrated recreation activities occur. The primary objectives for managing the ERMA are resource protection, public safety, and user satisfaction. Within this extensive area, public services, monitoring, improvements, and facility maintenance are conducted at a lower scale. Information on visitor usage of SRMAs and the ERMA is provided in **Table 3-22.**

Holter Lake/Sleeping Giant SRMA

The Holter Lake/Sleeping Giant Special Recreation Management Area totals 19,000 acres and is located on both sides of Holter Lake about 30 miles north of Helena. The SRMA includes a portion of the Lewis and Clark National Trail, the Sleeping Giant ACEC, the Sleeping Giant and Sheep Creek Wilderness Study Areas, seven developed recreation sites and about 30 dispersed boat-in camp sites. Both of the Wilderness Study Areas are recommended for wilderness designation and are currently closed to motorized uses. Four of the seven developed recreation sites are fee sites:

- Beartooth Landing.
- Woodsiding Trailhead.
- Sleeping Giant Trailhead.
- Departure Point: Fees – Camping $10, Day Use $2, Season Day Use Pass $25.
- Holter Lake Dam: Fees – Camping $6.
- Holter Lake Recreation Site: Fees – Camping $10, Day Use $2, Season Day Use Pass $25, Group Picnic Reservations $50.
- Log Gulch Recreation Site: Fees – Camping $10, Day Use $2, Season Day Use Pass $25, Group Picnic and Camping Reservations $50.

This SRMA is a high use area especially along Lake Holter. Primary recreation opportunities in this SRMA include camping, picnicking, boating, fishing, swimming, hiking, hunting, and viewing wildlife, spectacular landscapes, which feature Beartooth Mountain and the Gates of the Mountains Canyon.

Table 3-22
2005 Decision Area Visits and Visitor Use Days by Recreation Management Area

RMA	Visits	VUD[1]	% of Total Visits	% Total of VUDs
Headwaters ERMA	644,100	507,048	52%	44%
Holter Lake/Sleeping Giant SRMA	159,250	253,396	13%	22%
Humbug Spires SRMA	19,000	24,146	2%	2%
Lewis and Clark Trail SRMA	277,600	254,884	22%	22%
Scratch Gravel Hills SRMA	13,950	4,609	1%	0%
Upper Big Hole SRMA	133,200	113,916	11%	10%
Totals	**1,247,100**	**1,158,000**	**100%**	**100%**

[1] One VUD = 12 hours.
Source: USDI-BLM 2005c

Lewis and Clark Trail SRMA

The Lewis and Clark Trail Special Recreation Management Area totals about 16,300 acres of BLM land. It is a corridor that encompasses the lower reaches of the three rivers forming the Headwaters of the Missouri River (Jefferson, Gallatin, Madison) and the uppermost segment of the Missouri to Hauser Lake Dam. Missouri River reservoirs within this SRMA include Toston, Canyon Ferry, and Hauser Lakes. This SRMA includes the Lewis and Clark Historic Trail, two recently acquired areas (Ward and McMaster Ranches), 15 developed recreation sites, and numerous dispersed use sites along the lakes and river shorelines. Two of the 15 developed recreation sites are established fee sites.

- Clark's Bay Day Use Site: Fees – Day Use $2, Season Day Use Pass $25 and Group Picnicking Reservations $50.
- Devil's Elbow Recreation Site: Fees – Camping $10, Day Use $2, Season Day Use Pass $25 and Group Camping Reservations $50.
- Two Camps Vista.
- Spokane Bay.
- French Bar.
- White Sandy Recreation Site: Fees – Camping-$10.00 and Group Camping Reservations-$50.00.
- Ward Ranch Historical Site.
- Spokane Bay Trailhead.
- McMaster Hills West Trailhead.
- McMaster Hills East Trailhead.
- Spokane Hills South Trailhead.
- Lombard Recreation Site.
- Crimson Bluff.
- Lower Toston Recreation Site.
- Toston Dam Recreation Site.

The Lewis and Clark Trail SRMA is located between Helena, Bozeman, and Whitehall. Primary recreation opportunities include camping, power boating, river floating, fishing, swimming, horseback riding, hiking, hunting, and viewing wildlife/scenic landscapes.

Scratchgravel SRMA

The Scratchgravel Hills Special Recreation Management Area totals about 5,500 acres and is located immediately northwest of Helena. The area provides numerous day-use recreation opportunities. Residents of Helena and subdivisions around the Scratchgravel Hills area are the primary users of the community-based SRMA. This area includes numerous secondary roads and trails and three developed recreation sites none of which have fees:

- Head Lane Trailhead.
- Tumbleweed Trailhead.
- John G. Mine Trailhead.

Primary recreation opportunities provided by the Scratchgravel Hills SRMA include hiking, jogging, horseback riding, OHV riding, mountain biking, folfing, and limited fall hunting. Conflicts between motorized and non-motorized users are occurring. This area is currently closed to shooting outside the fall hunting season, open fires and fireworks. A cooperation management agreement exists with Lewis and Clark County to provide support services in the area.

Humbug Spires SRMA

The Humbug Spires SRMA totals about 11,000 acres and is located about 26 miles south of Butte along Interstate 15. A portion of this area was designated a BLM Primitive Area in 1972. Approximately 8,800 acres of the Humbug Spires Wilderness Study Area is recommended for wilderness designation. This SRMA is characterized by irregular drainages and hills that are forested with Douglas-fir and lodgepole pine. Special features include the numerous granite rock spires (nine rise 300 to 600 feet), Moose Creek, numerous riparian areas, old growth timber, and lush meadows. This SRMA contains one site, the Moose Creek Trailhead, which provides important access to an established hiking trail.

The Humbug Spires SRMA area offers many quality opportunities for primitive and unconfined recreation. Primary activities include hiking, tent camping, backpacking, stream fishing, horseback riding, rock climbing, fall hunting, wildlife viewing, nature photography, and snowshoeing. The SRMA is closed to motorized vehicle use.

Upper Big Hole River SRMA

The Upper Big Hole River Special Recreation Management Area totals about 15,000 acres of BLM land. The area is located west of Interstate-15 and Divide, along the Upper Big Hole River in Silver Bow, Beaverhead, and Deer Lodge counties. This SRMA includes numerous access roads, trails, 11 developed recreation sites, and numerous dispersed use locations along the river. One of the 11 developed recreation sites has an established fee.

- Divide Bridge Campground: Fee – Camping $6.
- Sawmill Gulch Trailhead.
- Divide Bridge Day Use Area.
- Jerry Creek Bridge.
- Dickie Bridge Recreation Site
- Bryant Creek Recreation Site.
- East Bank Recreation Site.
- Sawlog Gulch.
- Pintlar Creek.
- Maiden Rock East.

The Big Hole River offers some of the most outstanding sport fishing opportunities in the United States, especially during the famous salmon fly hatch season. The State of Montana has classified this river as a Class I or "blue ribbon" fishery. Other opportunities in the area include camping, picnicking, river floating, hunting, hiking, driving for pleasure and nature observation, which are all focused within the river corridor.

Headwaters ERMA

The Headwaters Extensive Recreation Management Area includes all BLM land not identified as an SRMA. This public land totals about 238,000 acres. Primary recreation site/areas include three OHV riding areas, three popular rock climbing areas, hiking trails, trailheads, river access sites, campgrounds and numerous dispersed use areas.

There are 12 developed recreation sites within this ERMA none of which have established fees, including:

- Carbella Recreation Site.
- Buffalo Hump Recreation Site.
- Crow Creek Recreation Site.
- Duck Creek Recreation Site.
- Galena Recreation Site.
- Radersburg OHV Site and Trailhead.
- Ohio Gulch OHV Site and Trailhead.
- Sheep Mountain Trailhead.
- Pipestone OHV Trailhead.
- Four Corners OHV Trailhead.
- Whiskey Gulch OHV Trailhead.
- Sheep Camp Recreation Site.
- Ringing Rocks Recreation Site.

Recreation Use

In 2003, 65 percent of visitors' time was spent engaging in recreation activities outside of developed recreation sites (USDI-BLM 2004c). In 2003, the ten most popular uses in the Decision Area included: camping; driving for pleasure, fishing, hiking, running, walking, big game hunting, OHV use, picnicking, power boating, swimming, and wildlife viewing (USDI-BLM 2003d). Camping and freshwater fishing had the most visitors and Visitor User Days (VUD) out of the top ten recreation activities in the Decision Area (USDI-BLM 2003d) (**Table 3-23**).

Table 3-23
2005 Decision Area Visits and Visitor Use Days by Primary Recreation Activities

Recreation Activity	Visits	Percentage of Total	Total Visitor Days	Percentage of Total	Concentrated Visitor Days	Dispersed Visitor Days
Fishing	166,100	13%	113,000	10%	83,000	30,000
Motorized Water Activity	159,300	13%	58,000	5%	38,000	20,000
Motorized Vehicle Travel	153,700	12%	115,000	10%	15,000	100,000
Hunting/Archery	151,500	12%	170,000	15%	0	170,000
Camping	147,600	12%	427,000	37%	337,000	90,000
Wildlife/Natural Viewing	146,800	12%	57,000	5%	17,000	40,000
Foot Travel	124,700	10%	99,000	9%	30,000	69,000
Picnicking	73,800	6%	26,000	2%	20,000	6,000
Non-motorized Boating	36,400	3%	27,000	2%	8,000	19,000
Swimming	24,900	2%	18,000	2%	14,000	4,000
Snow Skiing	18,900	2%	21,000	2%	21,000	0
Snowmobiling	18,500	1%	10,000	1%	0	10,000
Biking	12,500	1%	2,000	0%	0	2,000
Rock Climbing	6,300	1%	9,000	1%	0	9,000
Horseback Riding	6,100	0%	6,000	1%	0	6,000
Totals*	**1,247,100**	**100%**	**1,158,000**	**100%**	**583,000**	**575,000**

[1] One VUD = 12 hours

Source: USDI-BLM 2005c

Special Recreation Use Permits

The Butte Field Office manages about 25 Special Recreation Use Permits each year. The primary activity for 14 of these permits is big game hunting. Most hunting outfitter/guides pursue mule deer, elk, upland birds, bear, and mountain lions. The Special Recreation Use Permits for hunting are for day use only. No hunting camps exist within the Decision Area. Special Recreation Use Permits are also issued for rock climbing in the Humbug Spires, Indian Creek, and Allen Spur. Recreation use permits are also frequently issued for folfing, horseback riding, OHV group riding events, mountain biking events and other social gatherings.
All existing permits have been issued on a first-come, first-served basis. The authorized term for most existing permits is five years although policy allows for extensions up to 10 years when appropriate. Fee collecting for these special use permits are used to offset administrative costs, monitor approved activities and protect recreation resource values for future use.

Recreation Facilities

BLM has developed recreation sites on Hauser Lake and Holter Lake through donations under Federal Energy Regulatory Commission licensing agreements and exchanges with the State of Montana. Developed sites include Devil's Elbow Campground and the Clark's Bay Day Use Site on Hauser Lake, and Log Gulch Campground and Departure Point on Holter Lake.

Most dispersed developed recreation sites in the Decision Area contain picnic tables, vault toilets, improved boat launching ramps, and some parking areas. The Butte Field Office road system provides access to various trailheads throughout the area. Many of these sites have been acquired by BLM through exchanges and donations from the state and counties.

Recreation facility information collected from the developed-site inventory of Butte Field Office Facility Asset Management System (FAMS) database is summarized in **Table 3-24**.

Table 3-24
Developed BLM Recreation Sites within the Butte Decision Area

Type of Site	Number of Sites	BLM Prior to 1984	Developed or Acquired Since 1984
Campground	17	3	14
Day Use Site	8	3	5
River/Reservoir Access	4	1	3
Trailhead	17	0	17
Interpretative	3	1	2
Total	**49**	**8**	**41**

Travel Management, Access and Facilities

This section describes transportation facilities and their maintenance as well as other types of facilities administered by the BLM. Travel route availability decisions (open, closed or limited) are determined through site-specific Travel Management Plans. Most of the larger tracts of public lands have legal public access via existing federal, state, and county roads (**AMS Figures 2-23a, 2-23b, and 2-23c**). Many smaller tracts of public lands do not have legal access. In most cases, such parcels do not have resource values/demands that justify the costs for acquiring access. There are some situations where road segments to and within these parcels are important for a given resource use or to provide through access to other lands and are therefore included in the transportation plan.

Roads

The transportation road and trail system provides physical access for the public to state, private, and other federal lands throughout the Decision Area. Demands for the existing transportation network are directly related to the resources and uses within the PA. A transportation system is needed to maintain access for commercial activities (e.g. livestock grazing, timber harvest, mineral development, outfitting and guiding), non-commercial activities and casual use (e.g., OHV use, hunting, fishing, rafting, camping, bird watching, recreational driving, firewood gathering), and for administrative access to manage/protect resources and property.

The Decision Area has approximately, 856 miles of BLM system roads or trails with 510 miles recorded in FAMS. These roads and trails are within eight different counties and accessible via federal, state and county roads (**Table 3-25**).

Table 3-25
Butte Decision Area Road System

County	Miles
Beaverhead	50.4
Broadwater	201.2
Deer Lodge	12.2
Gallatin	0.8
Jefferson	261.4
Lewis and Clark	219.3
Park	4.2
Silver Bow	106.8
Total	**856.3**

Source: Facility Asset Management System (FAMS) Road Inventory (Appendix L of AMS).

The primary federal roads within the PA include Interstate-15, US-89, US-191, and US-287 Interstate-90 and US-12. Almost all of the BLM roads are single lane consisting of natural, compacted soils. A few high usage roads (maintenance level 4 and 5) are double lane with improved aggregate surfaces. There are also approximately 3 miles of paved, bituminous base roads associated with recreation sites. On average, approximately 80 miles of BLM roads are maintained annually by BLM crews. While the maintenance levels are identified for roads, funding often does not allow BLM to meet the maintenance provisions of the assigned levels.

Gates and cattle guards on the road system are constructed and maintained using available funds from multiple programs. These facilities are monitored and maintained as part of the Transportation and Facilities program.

Trails

The Butte Field Office maintains approximately 80 miles of motorized and non-motorized trails. The condition of these trails is periodically assessed and recorded under the BLM FAMS system. Maintenance is performed as capabilities allow through the recreation and facility maintenance programs. State trail grants and BLM Challenge Cost Share funds are critical sources of revenue for maintenance. Funding often does not allow BLM to fully meet maintenance level provisions.

Administrative Sites

The Butte Field Office has two Administrative Sites: Belmont and Bull Mountain Communication Sites. Radio communication service calls are done by BLM personnel from the Montana State Office. Department of the Interior requires these structures have a Periodic Review of each asset performed at a minimum of every three years, and a Comprehensive Condition Assessment performed a minimum of once every five years. Maintenance is performed on these two sites on an "as needed" basis.

Recreation Sites

The Butte Field Office is a high use recreation area, with 49 developed recreation sites. Types and usage is covered under Recreation Use. Tracking of maintenance is done through the FAMS database with a work order process in the development stage. The Department of the Interior requires these facilities have a Periodic Review of each asset performed at a minimum of every three years, and a Comprehensive Condition Assessment performed a minimum of once every five years. Maintenance is performed on these sites annually. BLM has a five year plan, which allows for funding on deferred maintenance and capital improvement assets. This competitive, BLM-wide funding addresses high cost backlog maintenance needs. An example of the use of this funding is the replacement of approximately 35 vault toilets with concrete, handicap accessible restrooms.

Bridges

The Butte Field Office currently manages three bridges that are all associated with OHV trails in the Pipestone area. Condition assessments are conducted every two years; major culverts are assessed on a 10 year cycle. These facility assets are recorded and tracked through the FAMS database. Maintenance of these bridges will continue to be performed on an "as needed" basis.

Signs

The Butte Field Office currently maintains hundreds of signs throughout the Decision Area. Most of these signs are associated with roads, recreation sites, and OHV riding areas. Sign categories are Regulatory, Directional, Traffic Control, Informational, and Identification. All signs are monitored annually and maintained on an "as needed" basis. A GIS data system has been developed to locate and record all field office signs. Most new signs are ordered as needed on an annual basis through the BLM National Sign Shop in Rawlins, Wyoming.

Land Ownership

Most of the larger tracts of public land have legal public access via existing federal, state, and county road systems. Many smaller tracts of public land do not have legal access. In most cases, such parcels do not have resource values to justify public interest in acquiring access. Some small tracts along rivers serve as important public access points and require protection of existing legal access or acquisition of new legal access.

Travel Management

Public expectations and demand for motorized and non-motorized recreation has changed substantially since the completion of the 1979 Dillon MFP and 1984 Headwaters RMP Plans. Advances in motorized and non-motorized recreation travel technology and use have increased the public's ability to traverse conditions and terrains not previously envisioned. As a result, motorized travel has led to adverse resource impacts, as well as increased conflict between motorized and non-motorized users, particularly at urban/rural interfaces. Public interest and demand for motorized and non-motorized travel opportunities are expected to continue to increase.

Travel Management Plans

Areas within the Butte Field Office that have existing travel plans include:

- Elkhorn Mountains – "limited" area designation – (with the exception of an approximately 632 acre "open" OHV use area near Radersburg).
- Clancy-Unionville – "limited" area designation.

- Whitetail-Pipestone – "limited" area designation - (with the exception of an approximately 5 acre "open" motorized motorcycle hill climb area).
- Sleeping Giant – "limited" area designation.

These areas are described briefly below. Environmental documents for each of these previously completed site-specific travel plans are available at the Butte Field Office.

Elkhorn Mountains

The Elkhorn Mountains travel management area is located along the east side of Interstate I-15, between Boulder and Helena. The Elkhorn Mountains Travel Management Plan, established August 1995, is a cooperative project between the Helena and Deerlodge National Forests and the Bureau of Land Management. The Travel PAs consists of approximately 160,000 acres of National Forest lands and 68,205 acres administered by the Bureau of Land Management. The plan was developed in collaboration with the Montana Department of Fish, Wildlife and Parks because of high wildlife values and designation of the Forest Service portion of the Elkhorns as a Wildlife Management Unit. This plan represents a balance between motorized travel opportunities and protection of resource values. No management changes were necessary in order to comply with the 2003 Statewide OHV ROD.

Clancy-Unionville

The Clancy-Union Travel PA is located along the west side of I-15, approx. 3 miles northwest of Clancy, Montana, approximately 10 miles south of Helena. Clancy-Union consists of 5,820 acres. The Final Decision Notice for the Clancy-Unionville vegetation manipulation and travel management Environmental Impact Statement was signed February 2000. Although the travel management planning portion of the EIS analysis was developed jointly by the Forest Service (Helena National Forest) and the BLM, this (above referenced) Record of Decision is specific to only BLM actions. The selected alternative provides a system of designated roads and trails to ensure a wide variety of motorized and non-motorized recreation opportunities while protecting important resource values. No management changes were necessary in order to comply with the 2003 Statewide OHV ROD.

Whitetail-Pipestone

The Whitetail-Pipestone Travel PA is bounded by I-15 in the west, I-90 in the south, and Montana State Highway 399 in the East. Whitetail-Pipestone consists of 28,648 acres. In 1995, the Forest Service and Bureau of Land Management issued a Notice of Intent to prepare a joint EIS for Whitetail-Pipestone analysis area. In June 1998, the BLM issued an Emergency Closure Order restricting motorized use to existing roads and trails until a decision could be issued. In 2000, the Forest Service withdrew from the project due to budget reasons. The BLM decided to proceed with an Environmental Assessment (smaller project area), and in March 2003 the travel plan for the BLM portion of this area was completed. The selected alternative provides a system of designated roads and trails to serve the needs of a wide variety of area users, while protecting important resources of the area (cultural, wildlife, vegetation, soil, and water). A plan amendment was initiated in concert concurrent with the travel plan EA. The plan amendment was approved August 2002, and converted a number of areas previously managed as Open to Restricted (Limited). No management changes in Whitetail-Pipestone were necessary in order to comply with the 2003 Statewide OHV ROD.

Sleeping Giant

The Sleeping Giant travel management area is located along the east side of Interstate I-15, approximately 30 miles north of Helena. It is bordered on the east by Hauser Lake and the Missouri River; and in the north by the small town of Wolf Creek. Totaling 18,300 acres, Sleeping Giant includes 11,609 acres of BLM lands managed as an ACEC, and 6,691 acres of BLM lands managed for multiple use. The ACEC contains two Wilderness Study Areas (Sleeping Giant, 6,666 acres; Sheep Creek WSA, 3,801 acres).

This travel plan was completed in March 2004. The plan protects the important resources of the area (WSAs, ACEC, wildlife, soils, vegetation, water quality, and cultural) while providing a designated system of roads to serve the needs of a variety of area users. No management changes were necessary in order to comply with the 2003 Statewide OHV ROD.

Other

Additional travel planning has been completed for several smaller "sub-planning" areas, including the Big Hole (Southwest Interagency Travel Management Plan), Confederate Gulch, Sawlog Creek, the Great Divide Ski area, and Nez Perce Ridge road. Several "emergency area closures" are in effect as well, pending future travel planning. The emergency area closures include the North Hills, Sawmill Gulch, Ward Ranch, the McMasters, and Spokane Hills.

In accordance with the 2003 OHV ROD and plan amendment, the Butte Field Office has identified and prioritized nine additional areas, all with "limited" area designations, needing site-specific travel planning. The nine proposed areas include:

- Helena (focus area – Scratchgravel Hills). High Priority
- East Helena (focus area – North Hills). High Priority
- Lewis and Clark County Northwest (focus area – Marysville). High Priority
- Boulder/Jefferson City. High Priority

- Upper Big Hole River. High Priority
- Missouri River Foothills. Moderate Priority
- Jefferson County Southeast. Moderate Priority
- Broadwater County South. Moderate Priority
- Park/Gallatin. Moderate Priority

The five high priority TPAs are described below.

Helena Travel Planning Area

The Helena TPA area contains 10,162 acres of BLM lands within the 95,492-acre TPA. The majority of lands in the TPA are privately owned (56,499 acres) with USFS lands making up a substantial portion as well (23,911acres). The approximately 52.2 miles of BLM roads make up about 7.5 percent of the approximate total of 694 road miles in the entire TPA. Most roads (528 miles) are on private lands.

Two sub PAs, known as *Scratchgravel Hills* and *Birdseye*, are focal points for current traveling planning efforts. A number of small isolated tracts (overall total of 3,106 acres), are scattered throughout the remainder of the Travel PA. **Maps 6 through 9** depict the Helena TPA.

The Scratchgravel Hills area is 4 miles north of the Helena City limits, and contains approximately 5,403 BLM acres, in 18 sections. The Scratchgravels are characterized by gently rolling to moderately steep terrain varying in elevation from 3,700 to 5,200 feet above mean sea level. The Scratchgravel Hills have a dry climate. Average minimum/maximum temperatures are 8/29° Fahrenheit in January and 52/84° Fahrenheit in July. Average precipitation is approximately 12 inches. Average annual snowfall is 48 inches. Average number of days with snow on the ground is 61.

Seven soil series are represented in the Scratchgravel Hills. Most soils are highly erodable and several series are very shallow. Rock outcrops are prevalent in several mapping units. Existing vegetation at lower elevations include grasses, forbs, and scattered shrubs with patches of occasional juniper and ponderosa pine woodlands, with carpet-like areas of pine/fir colonization commonly occurring. Higher elevations and north facing slopes are dominated by ponderosa pine forest with a bunchgrass or fescue under-story that commonly contains stagnant, old Douglas-fir seedlings.

The Birdseye area lies 1.5 miles southwest of the Scratchgravel Hills, and contains approximately 2,655 BLM acres, in eight sections. The Birdseye area is similar in character, but the eastside rain shadow effect is much more pronounced with stubby limber pine and Douglas-fir trees dominating the open woodland areas. Ponderosa forest values are few, limited to north slopes bordering some of the deeper draws.

Scratchgravel Hills and Birdseye constitute islands of undeveloped hills surrounded by an area experiencing steady residential growth. According to the 1984 Scratchgravel Hills Comprehensive Management Plan, the Scratchgravel area contained 300 homesites in three major subdivisions and several smaller developments. Since that time, residential housing has continued to grow, with over 1,000 residential homes currently located in and around these same areas (U.S. Census Bureau 2000). Two additional residential developments, Big Silver Creek, and Cornerstone Village, are being planned. Big Silver Creek development will be located near the northwest corner of Scratchgravel Hills, adjacent to Big Silver Creek road. If approved, 82 residential units will be constructed on approximately 1,500 acres. The Cornerstone Village development will be located southeast of the Scratchgravel Hills, bordered by Franklin Mine Road on the north, and Head Lane on the west. If approved, Cornerstone Village will consist of over 800 single family dwellings located on 284 total acres of land. The development will also include a 300 person school occupying 30 acres.

As a result, the character of the area is rapidly changing from a rural setting to a residential neighborhood setting.

As the population and residential development of these areas continues, a significant increase in recreational and other uses of the Scratchgravel Hills and Birdseye areas is projected.

Existing Land Use

Recreation

Existing recreational use of the Scratchgravel Hills area is well established. There is an extensive network of roads and trails used by hikers, joggers, horseback riders, motorcyclists, OHV riders, and 4-wheel drive enthusiasts. Some "folfing" and paintball game activity has occurred during the recent years. Hunting is considered marginal, big game numbers are low. Current management prohibits the use of fireworks and the discharge of firearms (except during hunting season).

Snow cover in the Scratchgravel Hills is generally inadequate for snowmobiling or cross country skiing. As a result, the area provides convenient winter time hiking, mountain bike, motorized travel and horseback recreation opportunities for local residents as well as those from the city of Helena.

As throughout the west, this combination of rapid urbanization and increased recreational use has led to sharp conflicts; between area residents, recreation users, and among recreational users themselves. The majority of conflict stems between non-motorized and motorized recreational use activity. As expressed during the public scoping meeting, many area residents deliberately located near Scratchgravel Hills in order to pursue recreational interests.

This TPA contains three developed recreation sites (Head Lane, John G. Mine, and Tumbleweed Trailheads) and one Special Recreation Management Area (Scratchgravel Hills). All remaining lands within the TPA are managed as part of the Butte FO Extensive Recreation Management Area. There are no existing and potential Special Designations within this TPA.

Mineral/Energy Development

The Scratchgravel Hills is an area which contains precious and base metals in both hard rock and placer deposits. Historic production came from numerous small mines throughout the area. Over the years there have been a large number of patented and unpatented mining claims distributed throughout the area. While presently only a few claims are maintained, increases in precious metal prices could increase the mineral activity level.

Range Management

Thirteen grazing allotments exist in the Helena TPA. The largest allotment is the Granite Creek allotment in the Birdseye area. Due to the extended drought conditions, the amount of active grazing use has declined in the last 4 to 5 years. Grazing use may increase if wetter climate conditions return.

Forest and Fire Management

There are approximately 3,100 acres of forest and woodland in the Helena TPA. The Scratchgravel Hills portion was withdrawn from general forest management in the Headwaters RMP during the last 20 years. The closed pine forest conditions and extensive colonization have left many areas with dense and hazardous fuels conditions. It is expected that the area would burn intensely with severe impacts similar to those seen to the east when the Spokane Hills near Canyon Ferry burned in 2000. The fuels in the area are classified in the moderate to high hazard range. In 2000/2003 a fuels hazard assessment was done for the Scratchgravel Hills area. Findings from that assessment show that in the forested areas, 52 percent of forested stands rated high; and 37 percent of forested stands rated moderate for hazardous fuels conditions in the Scratchgravel Hills Fire Management Zone. In consideration of the WUI (Wildland/Urban Interface) that surrounds the area, the Scratchgravel Hills are a high priority for fuels reduction work. Mechanical fuel reduction work has been conducted in the Silver Creek area within 500 feet of the public/private land boundaries over the last several years. More mechanical projects are anticipated to reduce the fuels and enhance the health of the forest ecosystems.

Cultural/Historic

Prehistoric sites in the Scratchgravel Hills are very sparse, even though they are relatively close to the Montana City Archeological District. They consist mainly of lithic scatters and may or may not be related to activity in the archeological district. European sites in the Scratchgravel Hills are related to mining. Placer mining started in the Scratchgravel Hills earlier than in Last Chance Gulch, but was never very productive. Several lode mines were developed later, but the area never produced as well as the other districts in the Helena area.

Military Activity

The Montana State National Guard is known to use portions of the Birdseye area during training activities.

Important Resource Issues

Wildlife

The Helena TPA is heavily populated with subdivisions, ranches, and development, especially near the town of Helena. Although human development is extensive in the TPA, habitat is still available for those wildlife species that depend on grassland/shrublands and dry forests.

BLM lands in the TPA are dominated by grassland and shrubland habitats (6,501 acres) as well as dry Douglas fir and ponderosa pine forests (3,700 acres).

Grasslands and sagebrush habitats within the TPA provide habitat for elk, mule deer, pronghorn antelope, badger, coyote, red fox, mountain cottontail, whitetail jackrabbit, ground squirrels, and other small mammals.

Forests in the TPA provide habitat for species including but not limited to: elk, moose, mule deer, coyote, red fox, bobcat, cougar, black bear, mountain lion, mountain cottontail, marmot, red squirrel, and other small mammals.

The TPA also provides habitat for numerous forest and grassland bird species including but not limited to: pileated, hairy and downy woodpeckers, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, blue grouse, hairy and downy woodpeckers, dusky flycatcher, pine siskin, western tanager, black-capped chickadee, red-breasted nuthatch, mountain bluebird, Townsend's solitaire, dark-eyed junco, Cassin's finch, pine siskin, red crossbill, western meadowlark, Swainson's hawk, red-tailed hawk, horned lark, mountain bluebird, prairie falcon, chipping sparrow, savannah sparrow and vesper sparrow.

Critical fawning and foraging habitat for pronghorn antelope was historically located in the southwest section of Scratchgravel Hills. Year-round pronghorn habitat was also historically found in the northeast corner of the Helena TPA. Although portions of the area still provide pronghorn habitat, due to the extensive amount of development around Helena, the area no longer provides high quality pronghorn habitat.

A 50,000 acre strip through the middle of the Helena TPA continues to provide winter range for mule deer. The entire western half of the TPA, approximately 56,400 acres, is winter habitat for elk.

The Birdseye section of the Helena TPA is within a wildlife movement corridor that provides a connection between the Northern Continental Divide Ecosystem and the Greater Yellowstone Ecosystem. This corridor also provides for local daily movements and seasonal movements between higher elevation summer range along the Continental Divide and lower elevation winter range. This corridor is predominately moderate quality due to fairly high road densities in the TPA (greater than 2 mi/mi^2).

This TPA also provides habitat for several BLM sensitive species including; golden eagle, flammulated owl, Brewer's sparrow, long-billed curlew, ferruginous hawk, Swainson's hawk, and long-eared bat.

The long history of mining in the area has created habitat for bats and surveys have been conducted to determine bat use of the area. Eighteen abandoned mines were surveyed in 2002 and 2003 in the Scratchgravel Hills. Bat species identified during these surveys included: western small-footed myotis, long-legged myotis, hoary bat, big brown bat, and several unknown myotis species. As a result of surveys, five abandoned mines were closed with bat gates.

Aquatics/Fisheries

This 95,500 acre TPA is found within the Upper Missouri watershed. There are approximately 71 miles of perennial streams and 37 miles of fish bearing streams on all land ownerships in the TPA. Non-native fish species found in the TPA include brook, brown, and rainbow trout. Native fish found in the TPA include white sucker, longnose sucker, westslope cutthroat trout, and mottled sculpin.

On BLM lands, there are approximately 6.0 miles of perennial stream, 2.0 miles of fish bearing stream and 5.5 miles of intermittent stream. Fish species found in streams managed by the BLM include non-native brook trout and native westslope cutthroat trout.

In the entire TPA, there are five streams (Skelly Gulch, East Skelly Gulch, Threemile Creek, Greenhorn Creek, and Silver Creek) with westslope cutthroat trout (BLM sensitive species). Westslope cutthroat trout are found throughout approximately 20 miles of stream. Genetic testing has been completed on two streams (Threemile and Skelly Gulch) and has confirmed these fish to be 100 percent genetically pure.

In the Helena TPA, there are two streams on BLM lands (Skelly Gulch and Greenhorn Creek) where westslope cutthroat trout have been confirmed. Greenhorn Creek provides approximately 1 mile of habitat for westslope cutthroat trout and these fish have not had genetic testing to confirm their purity. Skelly Gulch also provides approximately 1.0 mile of habitat for westslope cutthroat trout and genetic testing has confirmed these fish to be 100 percent genetically pure.

Water Resources

Within the entire Helena TPA there are six streams (totaling about 37.9 stream miles) that are listed as impaired water bodies by Montana Department of Environmental Quality. Impaired reaches of two of these streams, Sevenmile Creek (0.1 mile), and Skelly Gulch (0.8 mile) flow through BLM managed lands. Siltation is identified as one of the impairment types for both of these streams.

Riparian

Approximately 7.8 miles of riparian reaches and associated habitat are found in the Helena travel planning area. Current condition ratings on these reaches include 3.7 miles in Proper Functioning Condition, 1.6 miles Functioning-At-Risk condition, and 1.7 miles in non-functioning condition. Trends on most reaches are upward or static.

Currently, the roads having the biggest impacts on riparian conditions in this TPA are the county road along Sevenmile Creek and the access road paralleling Skelly Gulch. Both roads deliver extra sediment to these streams as well as affecting creek banks.

Sensitive Plants

The overall TPA contains populations of two sensitive species, linearleaf fleabane, and lesser rushy milkvetch. Both species grow in the Scratchgravel Hills area. Linearleaf fleabane grows on dry, often rocky soil from the foothills up to moderate elevations, frequently with sagebrush. Lesser rushy milkvetch grows in grassland and shrublands often in association with bluebunch wheatgrass, fescue species, and mountain big sage. Noxious weed infestations pose the greatest threat to these species' long-term health and viability.

Noxious Weeds

The primary noxious weeds in the Helena TPA are leafy spurge, Dalmatian toadflax, whitetop, spotted knapweed, houndstongue, and Canada thistle.

In the Scratchgravel Hills area, leafy spurge is present throughout the area with the highest densities found in draws. Dalmatian toadflax infestations are spreading throughout the southern edge and located sporadically in other areas. Whitetop, spotted knapweed, houndstongue, and other undesired species are found in small, scattered infestations.

In the Birdseye area, leafy spurge, houndstongue, Canada thistle, and spotted knapweed are found in small to moderate infestations along roadways, drainages and some upland areas. Dalmatian toadflax, whitetop, and other invasive species like bull thistle and common mullein have been observed.

Soils

Seven soil series are represented in the Scratchgravel Hills. Many of the soils are highly erodable and several series are very shallow.

Minerals

The mineral potential of the Scratchgravel Hills is rated as high by the Montana Bureau of Mines and Geology. This high mineral potential in conjunction with the high number of mining claims in the area suggests the continuing potential for small scale mineral exploration and placer operations.

Summary Public Scoping Comments

Two public scoping meetings were conducted for the Helena TPA (December 1, 2004 and January 6, 2005). Both meetings were especially well attended by residents of the Scratchgravel Hills area. The majority of the written and oral comments received during the meetings centered on conflicts between motorized and non-motorized recreation users. Representatives of both user groups expressed a wide range of points of view, with discussions leading to the inevitability of the need for cooperation and resolution among conflicting uses. Some participants felt that although the Scratchgravel Hills area is not overly large, accommodations for both motorized and non-motorized uses could be made. Strategies included creating separate areas of use for motorized and non-motorized activities.

Other public issues and concerns included:

- Illegal activities - A number of comments were made during both meetings concerning a range of illegal activities, including dumping, drug use, underage alcohol use, unattended camp fires, and vandalism. There was widespread agreement that most of these activities were associated with motorized use, and oftentimes occurred after dark.
- General need for improved mapping/signing and trailhead facilities.
- Active enforcement of completed travel plan.
- Soil erosion.
- Noxious weeds.
- Wildland fire.

East Helena Travel Planning Area

The 200,991-acre East Helena TPA contains 20,039 acres of BLM lands. There are approximately 71 miles of BLM road, making up about 8 percent of the approximate total of 892 road miles in the TPA. The majority of roads (690 miles) lie on private lands.

The area lies in the Helena Valley, which has a dry climate. Average minimum/maximum temperatures are 8/29 degrees Fahrenheit in January and 52/84 degrees Fahrenheit in July. Average precipitation is approximately 12 inches. Average annual snowfall is 49 inches.

Five sub-PAs, known as the North Hills, Mt. Bend, Ward Ranch/Centennial Gulch, McMasters Hills/Spokane Bay, and Spokane Hills/Breaks areas, are focal points for current traveling planning efforts. In addition, there are a number of smaller, isolated tracts scattered throughout the remainder of the East Helena TPA that may also require travel planning. Of the five, the North Hills has the most need for travel management, based on road density and current use levels. **Maps 10 through 13** present the East Helena TPA.

The North Hills area lies approximately three miles north of Lake Helena, and occupies 4,708 acres. The North Hills are bordered on the west, north, and south by private property, and by the Missouri River on the east. The majority of the North Hills are characterized by gently rolling to moderately steep terrain varying in elevation from 4,100 to 5,280 feet. The area along the Missouri River has a number of sheer, vertical rock cliffs that extend down to the river's edge. With the exception of several large open meadows, the lower elevations are vegetated with a moderately thick ponderosa pine forest; and occasional juniper and scattered shrubs. The higher elevations and north facing slopes are dominated by pine/fir forest with a bunchgrass or fescue under-story.

During the late summer of 1984, the northern half of North Hills was burned in a major wildfire. The fire resulted in severe impacts to many of the pine stands located on the north and east aspects of American Bar, Foster and a number of secondary drainages. Following the fire, emergency stabilization efforts (grass reseeding) were undertaken to reduce sedimentation into Holter Lake. Due to the lack of natural forest seed sources, areas that have converted to grass and downed log habitats will likely remain deforested for decades.

Mt. Bend is located approximately 3 miles east of Lake Helena, on the west side of York Bridge. Approximately 1,106 acres in size, Mt. Bend is bordered by Hauser Lake on the north and east, and by private property on the west and south. Mt. Bend can be described as a steep hill, ascending in elevation from south to north, and then descending again in the north to the Hauser Lake shoreline. The south facing slopes are vegetated by grasses, scattered trees and shrubs, while the higher elevations and north facing slopes are dominated by pine/fir forest.

The Ward Ranch/Centennial Gulch area is located along the eastern shore of Hauser Lake. Approximately 4,361 acres in size, it is bordered by Hauser Lake on the west, USFS lands in the north and east, and private property and Bureau of Reclamation lands on the south. The area extends north for approximately 7 miles, from the Riverside Recreation Site to Soup Creek; and varies in width from one to two miles. The area is composed of a combination of pre-existing BLM lands and the newly ac-

quired 2,200 acre Ward Ranch. The physical environment is similar in nature to the North Hills and Mt. Bend areas, and is characterized by gently rolling to moderately steep terrain varying in elevation from approximately 3,600 feet along Hauser Lake to 4,750 feet near the York Bridge area. The topography along the Missouri River varies from gently sloping foothills hills and valley meadows, to steep rock cliffs. With the exception of several large open meadows (and some cleared ranch lands), the lower elevations are vegetated with a moderately thick ponderosa pine forest; and occasional juniper and scattered shrubs. Higher elevations and north facing slopes are dominated by pine/fir forest with a bunchgrass or fescue under-story.

The McMasters Hills/Spokane Bay area is located at the southern end of Hauser Lake, approximately 2.5 miles west northwest of Canyon Ferry Dam. Approximately 1,588 acres in size, the area is bordered on the north by a combination of BLM, private, and Bureau of Reclamation lands (which in turn is bordered by Hauser Lake); and by private property on the west, south, and east. The area is composed of a combination of pre-existing BLM lands and the newly acquired McMaster's (North) ranch complex. The terrain varies in elevation from 3,750 to 4,100 feet. The southern portion of the McMasters Hills/Spokane Bay area is characterized by open valley land, and is the site for the McMaster's ranch complex, located adjacent to Spokane Bay and Spokane Creek. The ranch complex includes several cultivated fields, developed ponds, corrals/fences, residential housing, and an assortment of ranch buildings. With the exception of the ranch complex, which has mature cottonwood trees growing along Spokane Creek, the lower elevations are vegetated with native grasses, cacti, and a few scattered juniper and pine trees. The northern portion of the McMasters Hills/Spokane Bay area is a mosaic of steep sided ridges rising 300 to 400 feet above the valley floor, with rolling benches. The upper elevations are vegetated with sagebrush, native grasses, small groups of ponderosa pines, and several formerly cultivated fields planted to crested wheatgrass.

The Spokane Hills/Breaks area is located along the western shore of Canyon Ferry Lake. Approximately 7,492 acres in size, the Spokane Hills/Breaks area is bounded on the north, west, and south by private property. The east boundary is bordered by Bureau of Reclamation lands, which in turn are bordered by Canyon Ferry Lake. The Spokane Hills/Breaks area is composed of 6,286 acres of BLM lands (including the newly acquired McMaster's "South" ranch complex) and 1,205 acres of Conservation Fund lands. The area extends north for approximate 9 miles, from the White Earth Recreation Site to the Lorelei Recreation Site, and varies in width from 0.5 to 1.5 miles. The area is characterized by steep sided ridges punctuated by drainages and gullies. The Spokane Hills burned in their entirety on both the public domain and McMasters properties in the major Bucksnort Wildfire of 2000. Approximately 60 to 80 percent of the forest stands burned intensely with few surviving trees for natural reforestation.

Each of the five areas could be described as an island of undeveloped land, surrounded by steady residential growth. This is particularly true for the North Hills focus area.

According to the 2000 U.S. Census, the North Hills had 121 homes, with an estimated population of 300 people living in and around the area.

Existing Land Use

Recreation

Recreational use is well established for all five sub- PAs. Recreational use activities include: camping, hunting, target practice, hiking, jogging, horseback riding, mountain bike riding, and a range of motorized use (motorcyclists, OHV riders, and 4-wheel drive enthusiasts). Snow cover is generally inadequate for snowmobiling or cross country skiing. As a result, the sub-PAs provide convenient recreation opportunities for adjacent residents, as well as those from the city of Helena. Road density is relatively low for all five areas.

Three (travel related) emergency closures are in effect for the East Helena TPA, pending future resource and travel planning efforts. In 1991, in cooperation with the MFWP's "Block Hunting Management Program" the BLM restricted motorized travel in the North Hills to "designated open routes from October 15 to December 1". The purpose of the emergency closure was to minimize big-game harassment, soil erosion, vegetative loss, visitor safety hazards, and the spread of noxious weeds.

In 2004, an emergency closure was issued for the McMasters Hills/Spokane Bay sub-PA. With the exception of motorized access to the McMaster family residence/ranch complex, the closure prohibits all motor vehicle use from the former ranch lands. The purpose of the closure is to protect public health and safety, prevent the spread of noxious weeds, and protect cultural and historic values until a resource inventory is completed and public uses can be evaluated through resource management planning.

A 2004 emergency closure was also issued for the former Ward Ranch (Ward Ranch/Centennial Gulch sub-PA). Under the land transfer agreement, the former owner's will continue to reside at the ranch complex. The emergency closure restricts motorized public access from the ranch complex; non-motorized public access (hiking, horseback) is allowed. In addition, it provides an area shooting restriction for the protection and safety of the residents.

This TPA contains 11 developed recreation sites (White Sandy, Devil's Elbow, Two Camps Vista, Clark's Bay, Ward Ranch, Spokane Bay, French Bar, Spokane Bay TH, McMaster Hills W. TH, McMaster Hills E. TH, Spokane Hills S. TH) and one Special Recreation Man-

agement Area (Lewis &Clark National Historic Trail). All remaining lands within the TPA are managed as part of the Butte FO Extensive Recreation Management Area. Existing and potential Special Designation areas within this TPA include the Lewis & Clark NHT and the eligible Missouri River WSR segment below Hauser Dam.

Mineral/Energy Development

The East Helena TPA includes several historic mining districts; Missouri River, York, Magpie Gulch, Confederate Gulch, Hellgate, Winston, and Park (Indian Creek). Most of these mining district are renowned for their placer mines, including the "bars" of the Missouri River; Ming's, American, El Dorado, Spokane, French, and Dana's. These bars hosted rich deposits of placer gold and sapphires. Production records are incomplete, but likely total around $15,000,000. Confederate Gulch was the richest producer. The placer gold was derived from lode deposits associated with intrusives in the Elkhorns and Big Belts. Production from lode deposits continued until 2002 when the Apollo Gold Diamond Hill Mine up Indian Creek closed. Mineral properties at Winston and Miller Mountain have had considerable exploration. Other mineral resources in the East Helena TPA include decorative building stone from the Greyson Shale Belt formation, a moderate potential for oil and gas development, and a low potential for stratibound copper deposits.

Active claims are common in the areas with high potential and there are active notices in the East Helena TPA as well.

Overall, there is low potential for leasable fluid mineral development throughout federal mineral estate lands in the Butte Field Office. However, in this context, the Reasonably Foreseeable Development Scenario for the Butte RMP identified approximately 13,492 acres of federal mineral estate lands in this TPA where oil and gas development potential is slightly higher (low to moderate) and may potentially occur.

Range Management

Ten grazing allotments exist in the East Helena TPA. The largest allotment is the Spokane Hills Individual allotment in the Spokane Hills/Breaks area. Due to the extended drought conditions and the 2000 Bucksnort fire, the amount of active grazing use has declined in the last four to five years. Grazing use may increase if wetter climate conditions return. BLM has cooperatively participated with private landowners, the State of Montana, the Bureau of Reclamation, and the Conservation Districts on a sheep and goat weed control project in the Spokane Hills/Breaks area the past three years.

Forest and Fire Management

Approximately 9,150 acres of inventoried forest land exist in the East Helena TPA, which does not include the McMasters properties scheduled for inventory prior to implementation of forest management activities. Active forest management activities have been limited as a result of budget considerations in the 1980s and 1990s to small forest product sales based on public requests, wildfire salvage and replanting. No large timber sales, landscape vegetation treatments or fuel management projects have occurred, except on the McMasters properties in the Spokane Hills under private management where a number of clearcuts and selected harvest occurred in the 1970s while the property was privately owned. The McMasters' areas fully regenerated after the extensive clearcutting, but the 2000 wildfire eliminated all the regenerating trees in those areas and the overstory trees that had provided seed for the natural regeneration were also killed in most areas. No public salvage or replanting occurred in the North Hills area after the 1984 fire, but approximately 220 acres of timber salvage and 250 acres of replanting occurred on public domain within 3 years of the Bucksnort Fire in the Spokane Hills, cumulatively amounting to 10 percent of the burned public domain. No forest management or further fire rehabilitation work is currently scheduled in the burn areas. The remaining forested areas are heavily stocked with second growth ponderosa pine and will be considered for both fuel reduction and forest health treatment work to deal with identified fuels and forest health problems.

In 2000/2003 a fuels hazard assessment was done for the North Hills Area. Findings from that assessment indicate that 66 percent of forested stands rated high and 13 percent rated moderate for hazardous fuels conditions in the North Hills Fire Management Zone. In consideration of the WUI (Wildland Urban Interface) that surrounds the area, the East Helena TPA is a high priority for fuels reductions work in the future.

Fire suppression for the East Helena TPA was delegated to the Forest Service as part of the offset of fire protection responsibilities in Montana.

Important Resource Issues

Wildlife

This TPA provides a diversity of habitats from agricultural fields to high elevation forests. BLM lands in the TPA, however, are dominated by dry forests of Douglas fir and ponderosa pine (10,702 acres) and grassland/sagebrush habitats (9,249 acres).

Forests in the TPA provide habitat for species including but not limited to: elk, moose, mule deer, coyote, red fox, bobcat, cougar, black bear, mountain lion, mountain cottontail, marmot, red squirrel, and other small mammals.

Grasslands and sagebrush within the TPA provide habitat for elk, mule deer, bighorn sheep, pronghorn antelope, badger, coyote, red fox, mountain cottontail, whitetail jackrabbit, ground squirrels, and other small mammals.

The TPA also provides habitat for a variety of forest and grassland bird species including but not limited to: pileated, hairy and downy woodpeckers, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, blue grouse, hairy and downy woodpeckers, dusky flycatcher, pine siskin, western tanager, black-capped chickadee, red-breasted nuthatch, mountain bluebird, Townsend's solitaire, dark-eyed junco, Cassin's finch, pine siskin, red crossbill, western meadowlark, Swainson's hawk, red-tailed hawk, horned lark, mountain bluebird, prairie falcon, chipping sparrow, savannah sparrow and vesper sparrow.

The majority of mule deer and elk winter range, approximately 42,000 acres, is located in the northern section of the East Helena TPA as well as along the shore of the reservoirs. The entire TPA is within pronghorn antelope habitat with approximately 20,000 acres of pronghorn winter range.

This TPA provides habitat for several BLM sensitive species including: golden eagle, flammulated owl, Brewer's sparrow, long-billed curlew, northern goshawk, ferruginous hawk, Swainson's hawk, and long-eared bat. The long history of mining in the area has created habitats for bats but surveys have not been conducted to assess use of these features. Habitat within the TPA also provides habitat for two BLM sensitive amphibians, the plains spadefoot, and the boreal toad. Several plains spadefoot toads were found in the late 1990s and 2001 in the southwest section of the East Helena TPA. Boreal toads were found near Canyon Ferry Lake.

The shorelines of upper Holter, Hauser, and Canyon Ferry Lakes provide good quality habitat for bald eagles, peregrine falcon, osprey, and numerous waterfowl.

Aquatics/Fisheries

This 201,000 acre TPA is found within the Upper Missouri watershed. There are approximately 171 miles of perennial streams and 100 miles of fish bearing streams on all land ownerships in the TPA. Fish species found in the TPA include non-native brook, brown and rainbow trout, walleye (Missouri River) as well as stocked Yellowstone cutthroat trout in Beaver Creek.

Native fish species found in the TPA include; white sucker, mountain whitefish, longnose dace, longnose sucker, stonecat, burbot, westslope cutthroat trout, and mottled sculpin.

On BLM lands, there are approximately 7.6 miles of perennial stream and an additional 1 mile of fish bearing stream.

In the entire TPA, there are approximately 14 miles of stream with westslope cutthroat trout. There are no streams on BLM lands in the TPA that provide habitat for westslope cutthroat trout in the East Helena TPA.

Spokane Creek (McMasters Hills/Spokane Bay area) is an important riparian area. The creek provides spawning habitat for brown trout, rainbow trout, and salmon in Hauser Lake. Additionally, the associated riparian area provides habitat for several plant and animal species as well as acting as a filter for water flowing into Hauser Lake.

Water Resources

Within the entire East Helena TPA there are seven streams (including the Missouri River), totaling about 44.2 stream miles, that are listed as impaired water bodies by Montana Department of Environmental Quality. Impaired reaches of two of these streams, Trout Creek (0.3 miles), and Prickly Pear Creek (0.9 miles) flow through BLM managed lands.

Canyon Ferry Reservoir and the Missouri River from Canyon Ferry Dam to Hauser Lake are both identified as impaired water bodies on the MDEQ 303(d) list. Canyon Ferry Reservoir has impairments related to excess nitrogen and ammonia as well as excess algal growth, likely related to municipal point source discharges, septic systems, agriculture, and abandoned mine lands. Canyon Ferry also has excessive arsenic and thallium attributed to contamination from abandoned mine lands. Missouri River from Canyon Ferry Dam to Hauser Lake has impairments primarily related to excessive nutrients and oxygen deficiency. These impairments are attributed to dam construction, grazing in riparian or shoreline zones, municipal point source discharges, and septic systems.

Riparian

Approximately 22.3 miles of riparian reaches and associated habitat are found in the East Helena travel planning area. Current condition ratings on these reaches include 4.4 miles in Proper Functioning Condition and 17.9 miles in Functioning-At-Risk (FAR) condition. Most of the FAR reaches are associated with the lake/river shoreline of Hauser lake/Missouri River. Trends on most reaches are upward or static. Currently, BLM roads or trails are having minimal impacts on riparian conditions in this TPA.

Sensitive Plants

The North Hills and Spokane Hills areas have likely habitat for a sensitive species—lesser rushy milkvetch. Populations of this species have been found in both areas on private land.

Noxious Weeds

The primary noxious weeds in the East Helena TPA are leafy spurge, spotted knapweed, Dalmatian toadflax, houndstongue, and Canada thistle. Small infestations of Russian knapweed and diffuse knapweed have been found and promptly treated.

In the North Hills area, large infestations of low to moderate density leafy spurge occur throughout this sub-PA. Other noxious weeds present are Canada thistle, Dalmatian toadflax, and small patches of Russian knapweed.

In the Mt. Bend area, large infestations of Dalmatian toadflax occur throughout this sub-PA. Leafy spurge, houndstongue, and spotted knapweed are also present.

In the Ward Ranch/Centennial Gulch area, large infestations of Dalmatian toadflax and spotted knapweed occur throughout this sub-PA. Scattered infestations of Canada thistle, leafy spurge, and houndstongue have been observed. Undesirable invasive species present include prickly pear cactus and large infestations of musk thistle.

In the McMasters Hills/Spokane Bay area, several infestations of Dalmatian toadflax, leafy spurge, spotted knapweed, and Canada thistle are present. Scattered infestations of musk thistle were also observed.

In the Spokane Hills/Breaks area, there are large infestations of spotted knapweed, Dalmatian toadflax, and leafy spurge in this sub-PA. Noxious weeds present in smaller patches are Canada thistle, Russian knapweed, and diffuse knapweed.

Soils

Soils range in depth from shallow to very deep and are typically very to extremely gravelly loams and clay loams with a few sandy loams. Soils formed from argillites, quartzite, volcanics, alluvium, or limestone.

Cultural/Historic

Cultural resources in the Helena valley reflect all of the ways of life that have been used since people have lived in Montana. Prehistoric Native American hunting sites and living areas are as old as 10,000 years. They may be tool material sites, or rock features that probably served a number of uses before the arrival of Europeans. After their arrival, site types diversified to include European activities – mostly related to mining and ranching. The Ward and McMasters ranches were established before the turn of the 19th century. The Ward family engaged in mining and logging, as well as ranching. The McMasters ranch began as a blacksmith's shop servicing the local stage and individual travelers. As time passed, the family gradually turned to ranching full time.

Summary Public Scoping Comments

A well attended public scoping meeting was conducted for the East Helena TPA on November 30, 2004. Most of the written and oral comments received focused on the North Hills sub-PA; however several comments were also received for the newly acquired Ward and McMasters' ranch lands.

The majority of comments centered on conflicts between motorized and non-motorized recreation in the North Hills. A number of participants felt that accommodations could be made for both motorized and non-motorized uses. Strategies included creating separate areas of use for motorized and non-motorized activities, and seasonal closures. Other participants advocated prohibiting all motorized travel in favor of horse and pedestrian travel, arguing the area is too small to provide motorized recreation opportunities.

Other issues and concerns were raised during the meeting included:

- Illegal activities - Dumping, drug use, underage alcohol use (keg parties), unattended camp fires, vandalism, and unauthorized travel.
- Target Shooting - A number of comments were made regarding unsafe and irresponsible shooting (trees destroyed).
- General need for improved boundary marking, signing, maps, and separate trailhead facilities for motorized and non-motorized users.
- Enforcement – Proactive law enforcement, increased uniformed patrols by BLM staff.
- Soil erosion.
- Noxious weeds.
- Wildland fire - In particular, WUI concerns adjacent to North Hills.

Lewis and Clark County Northwest Travel Planning Area

The 406,700-acre Lewis and Clark County Northwest TPA contains approximately 17,037 acres of BLM lands. There are approximately 68 miles of BLM roads, making up about 4.7 percent of the approximate total of 1,448 road miles in the TPA. The majority of roads (819 miles) lie on private lands.

Weather patterns for the lower elevations are similar to the Helena Valley, with average minimum/maximum temperatures of 8/29 degrees Fahrenheit in January, and 52/84 degrees Fahrenheit in July. Average annual precipitation is approximately 12 inches, with an average annual snowfall of 49 inches. Annual precipitation levels for the higher elevations range from 20 to 30 inches, with annual snowfall averaging 150 inches.

Four sub-PAs, known as Marysville/Great Divide Ski, Stemple Pass, Sieben Ranch, and Lincoln have been identified for planning efforts. Of the four, the Marysville/Great Divide Ski area has the most need for travel management, based on road density, current use level, and public scoping comments. **Maps 14 through 17** depict the Lewis and Clark County Northwest TPA.

The Marysville/Great Divide Ski sub-PA is located about 25 road miles northwest of Helena, Montana, and occupies approximately 12,178 acres. Marysville/Great Divide is bordered on the north and east by a combination of private and state lands, and on the west and south by USFS and private lands. The majority of the area is characterized by moderate (25 to 30 percent) to steep (50 percent) slopes. Elevations range from 5,700 to 7,230 feet. Upper elevation north and east facing slopes are heavily forested by lodge pole pine and sub-alpine fir,

while mid to lower elevations are Douglas fir and ponderosa pine. Low to upper elevation, west and south facing slopes are vegetated by fescue and bluebunch wheatgrass.

The Sieben Ranch sub-PA is located approximately 25 miles north of Helena, along the west side of Interstate-15. The sub-PA occupies approximately 1,612 acres. Sieben Ranch is bordered on the east by I-15, and on the north, west, and south by a combination of private and state lands. Medicine Rock Creek is the predominant feature, and flows easterly for approximately two miles through a moderately steep "V" shaped canyon. A graded dirt road parallels the creek bottom. Elevations range from 5,000 to 5,750 feet with the canyon's north facing slopes ascending steeply from the creek bottom. North facing slopes are vegetated by a moderately dense forest of fir and ponderosa pine, while the dryer less steep south facing slopes are populated by pine. Open meadows are located along the bench tops, and along the southerly facing slopes.

The Stemple Pass sub-PA is located approximately 13 miles north of Marysville, and occupies approximately 2,040 acres. The physical environment is very similar to the Sieben Ranch sub-PA. Virginia Creek is the predominant feature, and flows easterly for approximately two miles through a deep "V" shaped canyon. Elevations range from approximately 4,900 to 6,500 feet with the canyon's north and south facing slopes both ascending steeply from the creek bottom. The slopes are vegetated with moderately dense forest of spruce, fir, and ponderosa pine. Open meadows are located along the bench tops, and occasionally along the slopes.

The Lincoln sub-PA is located approximately 5 miles west of the town of Lincoln, and occupies approximately 894 acres. The physical environment is similar to the Sieben Ranch and Stemple Pass sub-PAs, but has higher levels of precipitation (approximately 15 to 19 inches). The Blackfoot River is the predominant feature, and flows westerly for approximately 1.5 miles through a "U" shaped canyon. Elevations range from approximately 4,250 feet along the river benches to 5,187 feet at Long Point. North facing slopes are vegetated by a moderately dense forest of western larch and fir, while the dryer south facing slopes are populated more heavily by ponderosa pine. Open meadows are located along the bench tops, and occasionally along the slopes.

Existing Land Use

Recreation

Recreational use is well established for the Marysville/Great Divide Ski area, particularly for winter sports. Winter sport activities include: snowmobiling, downhill skiing, backcountry skiing, ski racing, snowboarding, and snowshoeing. An extensive network of roads and trails support a wide range of off-season activities, including: camping, hunting, target practice, hiking, jogging, horseback riding, mountain bike riding, and motorized use (motorcyclists, OHV riders, and 4-wheel drive enthusiasts.

Marysville was a thriving mining town in the late 1800's, with a population of 4,000 at its peak. The core of Marysville is still present with approximately 50 structures in use and about 71 full time residents according to the 2000 U.S. Census. Additional residential development is located in the Canyon Creek and Little Prickly Pear areas.

The 1,600 acre Great Divide Ski resort, lies above the town of Marysville on the east flank of Mount Belmont, about 1 mile northeast of the Continental Divide. The Great Divide Skiing Company operates the resort under a lease agreement with the BLM (leasing approximately 900 acres) and private property owners. Great Divide Ski resort is not a destination resort (no lodging available), and relies heavily on a local market based in Helena. Visitation has increased from about 6,000 in the mid-1980s to over 60,000 during the 1998-1999 ski season. Approximately 1,200 visits are expected on a typical heavy use day. Current facilities include four chairlifts and a tow, a lodge (day-use only), a maintenance shop, snowmaking system, slope lighting system, parking lot, and 130 named trails.

The Stemple Pass, Sieben Ranch, and Lincoln sub-PAs receive limited recreation use. Stemple Pass and Sieben Ranch areas are frequented by big game hunters during the fall.

This TPA contains no developed recreation sites or SRMAs. All TPA lands are managed as part of the Butte FO Extensive Recreation Management Area. The only Special Designation in this area is a three-mile segment of the Continental Divide National Trail.

Mineral/Energy Development

The Marysville mining district is located west of Marysville. Production began in the early 1870s and by 1935 the district had produced $31million dollars worth of gold and silver. No production records are available since that time. Recent production has been limited to the Belmont in the late 1980s and early 1990s. There are reportedly still reserves remaining in the Belmont.

Historical information in BLM's LR2000 records indicates that 3,357 claims have been active throughout the Marysville area since 1977. Today only 40 claims remain active. While this decrease in the number of mining claims represents in part depletion of the high grade gold and silver deposits, it also represents cycles in the mining industry. The Montana Bureau of Mines and Geology evaluation ranked much of the area as having high mineral potential for future production. Additionally claims surrounding Bald Butte have been purchased by United Bolero for their molybdenum potential (molybdenum is used for steel hardening). Best estimates for reserves are 150 to 200 million tons at 0.05 to 0.07%

molybdenum. During winter 2006, Bolero began mining and is shipping ore to Philipsburg for processing.

Future mining production is always difficult to predict because it is a cyclic business that depends on technological abilities and market demand. However future mining nearly always reoccurs in old districts as these are the mineralized areas and multiple types of mineralization often occurs together. Therefore, the Marysville sub-PA has high potential for future mining and exploration.

Overall, there is low potential for leasable fluid mineral development throughout federal mineral estate lands in the Butte Field Office. However, in this context, the Reasonably Foreseeable Development Scenario for the Butte RMP identified approximately 20,640 acres of federal mineral estate lands in this TPA where oil and gas development potential is slightly higher (low to moderate) and may potentially occur.

Range Management

Fifteen grazing allotments exist in the TPA. The largest allotments are the Empire Creek, Drumlummon-Skelly, and Edwards Mountain allotments in the Marysville/Great Divide Ski sub-PA. Due to the extended drought conditions, the amount of active grazing use has been reduced in the last 4 to 5 years. Grazing use may increase if wetter climate conditions return.

Forest and Fire Management

Approximately 11,500 acres of inventoried forest land occur in the Lewis and Clark County NW TPA. The general character of the vegetation is forested in each of the sub-PAs, with large areas of cool, moist conifer and sub-alpine fir zones, and lower elevations dominated by the dry conifer zone. Some of the most productive forest lands in the Butte Field Office area occur in this area. Forest stands are mainly second growth, having been heavily affected by harvesting and use starting with area settlement in the late 19th century and continuing through the present. Few old growth stands exist and large wildfire events have not occurred since 1910. Most stands are considered to be commercial forest, and have few current limitations or restrictions as to the silvicultural practices and treatment techniques that may be utilized for forest management. With the exception of the Medicine Rock area, these lands are adjacent to and blend in with the Continental Divide Landscape, where a landscape analysis was completed by the Helena National Forest in 1996.

The Lewis and Clark County NW TPA has considerable areas of WUI (Wildland Urban Interface). The general character of the vegetation is forested in each of the sub-PAs, with large areas of cool, moist conifer and sub-alpine fir zones, and lower elevations dominated by the dry conifer zone. The fuels in the area are classified in the moderate to high hazard range. In 2000/2003 a fuels hazard assessment was done for the Marysville area. Findings from that assessment show that 33 percent of forested stands are rated high and 40 percent are rated moderate for hazardous fuels conditions in the Marysville Fire Management Zone. In consideration of the wild-land urban interface that surrounds the area, the Lewis and Clark County NW TPA is a moderate to high priority for fuels reductions work in the future.

Fire suppression for the Lewis and Clark County NW TPA was delegated to the USFS as part of the offset of fire protection responsibilities in Montana.

Cultural/Historic

Lewis and Clark County hosts a number of archeological resources dating back as long as Montana has been inhabited, at least 10,000 years. Site types include the entire range of subsistence types; hunting, game and plant processing and general habitation, and religious sites are present in the area. The arrival of Europeans is elusive in the archeological record. The presence of European goods does not necessarily indicate contact, but trade for those goods. However, a few ranches and numerous mines began to populate the area to the extent that their remains make up the dominant site type in the area.

Marysville began as a mining camp that grew up around the Drumlummon mine, discovered in the late 1860s by Irish immigrant, Tom Cruse. In 1876, Cruse relocated his old claim, the Drumlummon, and prospected for about six years before hitting a very rich vein of silver. He built a five-stamp mill at the upper end of Silver Creek, and the town of Marysville began. In 1883, Cruse sold his mining interests to an English company for $1,500,000. They proceeded to build two large stamp mills in Marysville, which operated for another 10 years. The waste piles from the mines were so rich that they were profitably leached two separate times.

Important Resource Issues

Wildlife

The Lewis and Clark TPA straddles the Continental Divide and historically provided high quality habitat for a variety of wildlife species. This TPA provides a diversity of habitats from agricultural fields to high elevation cool, moist forests.

BLM lands in the TPA are dominated by cool, moist forest with dry Douglas fir at the lower elevations (13,047 acres) and sagebrush and grassland meadows (3,990 acres). Forests in the TPA provide habitat for species including but not limited to: elk, moose, mule deer, coyote, red fox, bobcat, cougar, black bear, mountain lion, pine marten, river otter, beaver, snowshoe hare, mountain cottontail, marmot, red squirrel, and other small mammals.

Grasslands and sagebrush within the TPA provide habitat for elk, mule deer, coyote, red fox, mountain cottontail, ground squirrels, and other small mammals.

The TPA also provides habitat for forest and grassland bird species including but not limited to: pileated, hairy and downy woodpeckers, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, blue grouse, hairy and downy woodpeckers, dusky flycatcher, pine siskin, western tanager, black-capped chickadee, red-breasted nuthatch, mountain bluebird, Townsend's solitaire, dark-eyed junco, Cassin's finch, pine siskin, red crossbill, western meadowlark, Swainson's hawk, red-tailed hawk, horned lark, mountain bluebird and chipping sparrow.

Mule deer winter range is located along the eastern half of the TPA (158,140 acres) as well as near Lincoln (21,500 acres). Elk winter range is also located in the lower elevations along the eastern half of the TPA (193,800 acres) as well as around Lincoln (55,500 acres).

The western half of the TPA is within a wildlife movement corridor that provides a connection between the Northern Continental Divide Ecosystem and the Greater Yellowstone Ecosystem. This corridor also provides local daily movements and seasonal movements between higher elevation summer range along the Continental Divide and lower elevation winter range. Although this corridor has fairly high road densities (greater than 2 mi/mi^2) the quality of the corridor is moderate to high to wildlife based on the large amount of federal lands in the area.

The western half of the TPA (231,600 acres) is within the occupied range of grizzly bear extending south from the Northern Continental Divide recovery zone.

The Lewis and Clark County NW TPA is within the former Northwest Montana Recovery Area for the gray wolf. In 2003, a den site with a single female and five pups was located just south of the Great Divide Ski Area. The den was subsequently disturbed by humans and the female moved the five pups to an unknown location. Currently, there is one known pack in the area. Due to livestock loss, two other local packs were exterminated in February 2003.

Approximately 112,250 acres of cool, moist forest in the TPA provide habitat for the Canada lynx. The majority of lynx habitat is located in the western half of the area between Lincoln and Marysville. Dry, mature Douglas-fir, lodgepole pine, and ponderosa pine forest types at lower elevations provide habitat for the northern goshawk.

Two BLM sensitive amphibians have been found within the Lewis and Clark TPA, the boreal toad and the Northern leopard frog. Another BLM sensitive species, the wolverine, has also been documented west of the Continental Divide in the TPA.

The long history of mining in the Marysville area has created numerous habitats for bats. Bat species identified during surveys include: Townsend's big-eared bat (BLM sensitive species), silver-haired bat, big brown bat, and several unknown myotis species.

Aquatics/Fisheries

This 406,700 acre TPA is found within the Upper Missouri (257,265 acres) and Blackfoot (149,435 acres) watersheds. There are approximately 238 miles of perennial streams and approximately 292 miles of fish bearing streams on all land ownerships in the TPA. Fish species found in the TPA include non-native brook, brown, and rainbow trout. Native fish species found in the TPA include; white sucker, mountain whitefish, longnose dace, longnose sucker, westslope cutthroat trout, mottled sculpin, and bull trout.

On BLM lands, there are approximately 7.0 miles of perennial stream, 11 miles of fish bearing stream and 6.3 miles of intermittent streams. Non-native fish species found on BLM lands in the TPA include brook, brown, and rainbow trout. Native fish found on BLM lands in the TPA include; white sucker, mountain whitefish, longnose dace, longnose sucker, westslope cutthroat trout, mottled sculpin, and bull trout. In the entire TPA, there are approximately 220 miles of stream with westslope cutthroat trout of varying genetic purity and approximately 65 miles with bull trout.

On BLM lands, westslope cutthroat trout are found in nine streams for approximately 7.7 miles. The longest length of stream with westslope cutthroat trout is Virginia Creek, with 2 miles. Only three streams have had genetic testing; the Blackfoot River, Sauerkraut Creek, and Sawmill Gulch. Of these streams, only Sauerkraut Creek was found to have 100 percent genetically pure westslope cutthroat trout (less than 0.1 mile is on BLM managed lands). The Blackfoot River flows through the northwest corner of the TPA near the town of Lincoln and provides the only bull trout habitat in the Butte Field Office. Bull trout are found in approximately 2.0 miles of the Blackfoot River in the Decision Area.

Water Resources

Within the entire Lewis and Clark County NW TPA there are 19 streams (totaling about 111.9 stream miles) that are listed as impaired water bodies by Montana Department of Environmental Quality. Impaired reaches of five of these streams (Blackfoot River – 1.9 miles, Jennies Fork – 0.2 mile, Little Prickly Pear Creek – 0.7 mile, Silver Creek – 0.03 mile, and Virginia Creek – 2.0 miles) flow through BLM managed lands. Key types of impairment include heavy metal contamination, siltation, and flow alteration.

Riparian

Approximately 18.7 miles of riparian reaches and associated habitat are found in the Lewis and Clark Northwest travel planning area. Current condition ratings on these reaches include 11.1 miles in Proper Functioning Condition, 5.6 miles Functioning-At-Risk condition, and

1.7 miles in non-functioning condition. Trends on most reaches are upward or static.

Currently, the roads and trails having the biggest impacts on riparian conditions in this TPA are the county road along Ottawa Gulch, the trail along Woodchopper Gulch, the road along Empire Creek, the road in Towsley Gulch, and the county road paralleling Virginia Creek. All of these roads affect stream channels to some degree as well as delivering extra sediment during runoff events.

Sensitive Plants

Habitat for yellow lady's slipper does occur in the Marysville area. No populations have been documented there however.

Noxious Weeds

The primary noxious weeds in the Lewis and Clark County NW TPA are spotted knapweed, houndstongue, leafy spurge, Dalmatian toadflax, yellow toadflax, whitetop, and Canada thistle.

In the Marysville/Great Divide Ski Area, observed infestations include large patches of spotted knapweed with smaller infestations of houndstongue, whitetop, yellow toadflax, and Canada thistle. Undesirable weeds present include musk thistle and common mullein.

The majority of the Stemple Pass area has spotted knapweed infestations ranging from low to high canopy cover densities. This area has the largest single infestation of noxious weeds of the four sub-PAs.

In the Sieben Ranch area, large infestations of spotted knapweed with smaller infestations of houndstongue, leafy spurge, and Dalmatian toadflax occur in this area. Undesirable weeds present include bull thistle, musk thistle, and common mullein.

In the Lincoln area, small patches of spotted knapweed have been found in this sub-PA.

Soils

Soils in the Lewis and Clark County NW TPA are from limestone, granite, argillite, and igneous rocks. They range from shallow the very deep and in texture from gravelly loams and clay loams to extremely stony loamy sand. Limestone soils are the most stable and granite soils the most erosive.

Summary Public Scoping Comments

A well attended public scoping meeting was conducted for the Lewis and Clark County NW TPA on December 2, 2004. Most of the written and oral comments received focused on the Marysville/Great Divide Ski sub-PA. There were many comments received regarding future management of the Continental Divide Trail. The majority of comments centered on conflicts between motorized and non-motorized recreation, including winter sports activities. A number of participants felt that accommodations could be made for both motorized and non-motorized uses. Strategies included creating separate areas of use for motorized and non-motorized activities, and seasonal closures.

Other issues and concerns raised during the meeting included:

- Interagency Coordination – Maintain interagency connectivity and coordination with USFS and other adjacent agencies.
- Continental Divide Trail – Manage as non-motorized in cooperation with the USFS. Consider re-routing the existing trail away from existing or future planned motorized routes. Or, allow for motorized crossings at site specific junctions.
- Illegal activities – Dumping, drug use, underage alcohol use (keg parties), unattended camp fires, vandalism, and unauthorized travel.
- Access – Ensure access to mines and private property.
- General need for improved boundary marking, signing, maps, and separate trailhead facilities for motorized and non-motorized users
- Enforcement – Proactive law enforcement, increased uniformed patrols by BLM staff to ensure compliance with completed travel plan.
- Wildlife – Wildlife security and travel corridors.

Boulder/Jefferson City Travel Planning Area

The 60,418-acre Boulder/Jefferson City TPA contains approximately 14,487 acres of BLM lands. There are approximately 61 miles of BLM roads, making up about 15.6 percent of the approximate total of 392 road miles in the TPA. The majority of roads (212 miles) lie on private lands.

The largest contiguous portion of the TPA lies west of the town of Boulder; bounded on the south and east by Interstate-15. The remaining portion of the TPA extends northwards up to the community of Corbin. Several additional small communities (Fuller, Comet, Amazon, and Wickes) also lie within the TPA. Elevations range from 5,000 feet near Boulder to approximately 8,000 feet at Mt. Thompson. **Maps 18 through 21** depict the Boulder/Jefferson City TPA.

The area experiences four distinct seasons. Weather patterns for the lower elevations are similar to those for the Helena Valley, with average minimum/maximum temperatures of 8/29 degrees Fahrenheit in January, and 52/84 degrees Fahrenheit in July. Average annual precipitation is approximately 12 inches, with an average annual snowfall of 48 inches. Annual precipitation levels for the higher elevations range from 20 to 30 inches, with annual snowfall averaging 30 to 60 inches.

The majority of the area is characterized by moderately steep mountain terrain (15 to 35 percent slopes), punctuated by a number of small perennial and seasonal streams. North facing slopes are vegetated by a moderately dense forest of fir and ponderosa pine, while the dryer less steep south facing slopes are populated by pine. Occasional open meadows are located along the bench tops, and along the southerly facing slopes. Small stands of aspen can be found along the riparian areas. The lower elevations (located along the west side of I-15) are characterized by open sagebrush meadows with scattered juniper and pine groves.

Existing Land Use

Recreation

The Boulder/Jefferson City TPA contains a relatively dense network of BLM administered roads. Several maintained county roads (Big Limber Gulch, High Ore Creek, Finn Gulch, and Wickes) provide primary vehicle access. The majority of recreation use is by local and area residents. Primary recreation activities include Big Game hunting (deer, elk), OHV use (motorcyclists, ATV riders, 4-wheel drive), and winter snowmobiling. Other activities may include camping, hunting, target practice, hiking, jogging, horseback riding, and mountain bike riding. With the exception of some old mine sites, there are no known destination points or points of interest.

This TPA contains no developed recreation sites or SRMAs. All lands within this TPA are managed as part of the Butte FO Extensive Recreation Management Area. There are no Special Designations within this TPA.

Mineral/Energy Development

The Boulder/Jefferson City TPA is highly mineralized and thus incorporates numerous historic mining districts including Alhambra-Warm Springs, Amazon, Basin-Cataract, Boulder, Clancy-Lump Gulch, Colorado-Wickes-Corbin-Gregory, Golconda, and Montana City. Placer mines in the general area date back to the 1860s. Estimates report that placer mining in Jefferson County drainages alone produced 109,629 ounces of gold and 39,628 ounces of silver from 1902 to 1948 (Roby *et al.* 1960).

Placer mining was followed by lode mining in several drainages throughout the area. In 1890 Roby reports that three concentrating mills, six stamp mills, and four smelters were operating in Jefferson County.

The Free Enterprise was the largest producer of uranium in the area, although other occurrences are present in the district. Radioactivity is associated with silicified and altered zones in the batholith (Popoff and Irving 1952).

Limestone for smelter flux was quarried near Montana City at the turn of the century.

Presently the Montana Tunnels mine, centered on a large diatreme, operates an open pit mine. From 1984 to 2005 Montana Tunnels produced 1.3 million ounces of gold, 20 million ounces of silver, 312 million pounds of lead, and 853 million pounds of lead. Present mine permits allow mining to 2007 and the company is submitting a proposal to expand the operation to 2011.

The Golconda District (WSA area) has several mineralized deposits delineated to date. These include 750,000 tons of economic gold resources at a grade of 0.052 ounces per ton gold and a porphyry stock work, copper-molybdenum deposit containing what is described as at least 100 million tons of mineralized rock. The copper prospect was dropped in the late 1970s due to a decline in the price of copper at that time (USBM and USGS 1990).

Due to the strong mineralization in the area it is likely that there will be future proposals to explore for and possibly develop mineral deposits at some time in the future.

Range Management

Ten grazing allotments exist in the Boulder/Jefferson City TPA. The largest allotments are the High Ore, Sugarloaf, Boomerang and Amazon allotments. Due to the extended drought conditions and the Boulder complex fires in 2000, the amount of active grazing use has been reduced in the last 4 to 5 years. Grazing use may increase if wetter climate conditions return.

Forest Management

Approximately 9,500 acres of inventoried forest land occur in the Boulder/Jefferson City TPA. The general character of the vegetation consists of large areas forested with dry Douglas-fir conifer types found mainly on north and east aspects that are bisected with dry meadows, and large areas of open grass and sage vegetation on southerly aspects and broad ridges. Warm and dry ponderosa pine stands are found on south and west aspects, north of the Boulder Hills in the drainages that flow north toward the Missouri River by Helena.

The forest stands are mainly second growth, having been heavily affected by harvesting and use starting with area settlement in the late 19th century and continuing through the present. As a result, very few old growth stands remain in the TPA. A large, 12,500 acre wildfire complex occurred in the summer of 2000, where approximately 72 percent of the 4,000 acres of burned forests on BLM lands were severely damaged by stand replacement fire, potentially resulting in a quarter of the area considered to be deforested as few live trees remain for forest reestablishment in the large burn areas. The BLM planted 690 acres of the most severely burned with native conifers seedlings in 2002 and 2003.

While most stands were considered to be commercial forest, uneven aged silvicultural practices and treatment techniques have been proposed in current land use plan-

ning that would leave substantial over-story canopy elements in many areas under most treatment scenarios and would also require higher frequency treatment activities to achieve and maintain desired conditions through future planning cycles. The lands, mainly in and south of the Boulder Hills are located in the Boulder River Landscape, where the joint landscape analysis was completed with the Beaverhead-Deerlodge National Forest in 1998. The remaining lands occur in the Continental Divide Landscape, where the landscape analysis was completed by the Helena National Forest in 1996.

Cultural Resources

Cultural resources in the Boulder/Jefferson River valleys reflect all of the life-ways that have been used since people have lived in Montana. Prehistoric Native American hunting sites and living areas are as old as 10,000 years. There are tool material sites, rock features, shelters and various living areas that served a number of uses before the arrival of Europeans. After their arrival, site types diversified to include European activities – mostly related to mining and ranching.

Important Resource Issues

Wildlife

Habitat in this TPA is split almost evenly between Douglas fir or Douglas fir/lodgepole pine (30,000) and grasslands/shrublands (30,420 acres) with inclusions of willow, riparian habitat, and rocky outcrops. BLM lands in the TPA, however, are dominated by dry Douglas fir (9,500 acres) with sagebrush and grassland meadows (4,987 acres).

Forests throughout the TPA provide habitat for species including but not limited to: elk, moose, mule deer, coyote, red fox, bobcat, cougar, black bear, mountain lion, pine marten, snowshoe hare, mountain cottontail, marmot, red squirrel, and other small mammals.

Grasslands and sagebrush within the TPA provide habitat for elk, mule deer, pronghorn antelope, badger, coyote, red fox, mountain cottontail, whitetail jackrabbit, ground squirrels, and other small mammals.

The TPA provides habitat for forest and grassland bird species including but not limited to: pileated, hairy and downy woodpeckers, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, blue grouse, hairy and downy woodpeckers, dusky flycatcher, pine siskin, western tanager, black-capped chickadee, red-breasted nuthatch, Townsend's solitaire, dark-eyed junco, Cassin's finch, pine siskin, red crossbill, western meadowlark, Swainson's hawk, red-tailed hawk, horned lark, mountain bluebird, chipping sparrow, savannah sparrow and vesper sparrow.

The Boulder/Jefferson City TPA provides winter range for elk and mule deer. The entire TPA is considered winter range for elk while the lower elevations along the eastern half of the TPA are winter range for mule deer. The quality of winter range is extremely variable throughout the TPA due to topography, elevation, and seasonal weather patterns.

The Boulder/Jefferson City TPA provides habitat for several BLM sensitive species including: flammulated owl, Brewer's sparrow, long-billed curlew, northern goshawk, black-backed and three-toed woodpeckers and long-eared bat. The long history of mining in the area has created habitats for bats but surveys have not been conducted to assess use of these features.

Aquatics/Fisheries

This TPA is found within the Upper Missouri (27,000 acres) and Boulder River (33,000 acres) watersheds. There are approximately 81 miles of perennial streams and 32 miles of fish bearing streams on all land ownerships in the TPA. Non-native fish species found in the TPA include brook, brown, and rainbow trout as well as stocked Yellowstone cutthroat trout in Cataract Creek. Native fish found in the TPA are westslope cutthroat trout and mottled sculpin.

On BLM lands, there are approximately 13.5 miles of perennial stream, 4 miles of fish bearing stream and approximately 13 miles of intermittent streams.

In the entire TPA, there are 16.5 miles of stream with westslope cutthroat trout in five streams (Kady Gulch, South Fork Quartz Creek, Sullivan Gulch, High Ore Creek, and Clancy Creek). All of the streams, with the exception of Sullivan Gulch, have 100 percent genetically pure westslope cutthroat trout.

BLM lands in the TPA provide approximately 3 miles of habitat for 100 percent genetically pure westslope cutthroat trout in the Boulder/Jefferson City TPA. Westslope cutthroat trout are found in 2 miles of High Ore Creek, 0.5 mile of Kady Gulch and 0.2 mile of Clancy Creek. High Ore Creek had extensive reclamation work within the stream and riparian area to restore the stream channel and water quality. Currently, rainbow trout, brook trout, and westslope cutthroat trout are found in the stream.

Water Resources

Within the entire Boulder/Jefferson City TPA there are 10 streams (totaling about 32.8 stream miles) that are listed as impaired water bodies by Montana Department of Environmental Quality. Impaired reaches of seven of these streams (Basin Creek – 0.04 mile, Big Limber Gulch – 1.55 miles, Boulder River – 0.9 mile, Cataract Creek – 0.4 mile, Clancy Creek – 0.2 mile, Corbin Creek 0.1 mile, and High Ore Creek – 2.1 miles) flow through BLM managed lands. The most commonly identified impairments for these streams include siltation, heavy metals contamination, and direct habitat alteration.

Riparian

Approximately 17.1 miles of riparian reaches and associated habitat are found in the Lewis and Clark North-

west travel planning area. Current condition ratings on these reaches include 2.0 miles in Proper Functioning Condition, 10.2 miles Functioning-At-Risk condition, and 5.0 miles in non-functioning condition. Many of the reaches were affected by historical mining. Trends on most reaches are upward or static.

Currently, the roads and trails having the biggest impacts on riparian conditions in this TPA are the county roads along High Ore Creek, the west fork of Spring Creek. BLM roads and trails affect riparian conditions along Kady Gulch, Boomerang Gulch, Black Jim Gulch, Stagecoach Gulch, and Big Limber Gulch. All of these roads affect stream channels and also deliver excess sediment during runoff events.

Sensitive Plants

Muskroot was observed in this area in 1892. Some potential habitat at the base of talus slopes occurs in this area.

Noxious Weeds

Noxious weed and non-native, invasive species are well-established and spreading rapidly in the Boulder/Jefferson City TPA. The primary noxious weeds in this area are Dalmatian toadflax, spotted knapweed, whitetop, houndstongue, and Canada thistle. Non-native invasive species found include musk thistle, common mullein, and black henbane. The spread of weeds on BLM lands is particularly apparent where surface soils or native vegetation are disturbed. Some of the major disturbance factors on BLM lands are construction of roads and OHV travel. A substantial number of infestations occur adjacent to roads, power lines, streams, ditches, and canals indicating that primary carriers of weed seed are vehicles and water. Ground-based activities, particularly those involving motor vehicles or equipment, disturb surface soils which has the effect of preparing a receptive seed bed for these pioneering weed species.

Soils

Soils in this area are derived mainly from granite. Granite soils are more erosive and less stable than soils derived from other rocks. They are mainly cobbly sandy loams and loamy sand textures.

Summary Public Scoping Comments

A public scoping meeting was conducted for the Boulder Jefferson City TPA on November 16, 2004. The meeting was attended by six local residents. Most of the comments received during the meeting focused on Big Game hunting and winter sports (snowmobile) access. There were no comments or discussion regarding conflicts (either existing or potential) between motorized and non-motorized recreation, including winter sports activities. Other issues and concerns discussed during the meeting included:

- Interagency Coordination – Maintain interagency connectivity and coordination with USFS and other adjacent agencies, especially regarding winter snowmobile.
- Enforcement – Proactive law enforcement, increased uniformed patrols by BLM staff to ensure compliance with completed travel plan.

Upper Big Hole River Travel Planning Area

The Upper Big Hole River TPA is a relatively long, narrow shaped area (approximately 60 by 18 miles) located in the southwest portion of the Butte Field Office. This 357,275-acre TPA contains approximately 63,108 acres of BLM land. It includes BLM lands located along the north and south banks of the Upper Big Hole River as well as a large contiguous section located east of Interstate-15, near the town of Divide. A large contiguous portion extends south from Divide to the town of Melrose and includes the Humbug Spires Primitive Area. There are approximately 165 miles of BLM roads, making up about 12.6 percent of the approximate total of 1,309 road miles in the TPA. The majority of roads lie on private (540 miles) and Forest Service (459 miles) lands.

The western boundary of the Upper Big Hole River TPA is located approximately 10 miles east of the town of Wisdom, at the Deer Lodge/Beaverhead county line. From the western boundary, the TPA extends east for 32 miles to the town of Divide (near Interstate-15), and then easterly for an additional 28 miles, terminating at the common Jefferson/Silver Bow/Madison County boundary line. At its widest point (adjacent to I-15), the TPA extends south for approximately 18 miles, from the Feely Hill/I-15 exit to the town of Melrose. **Maps 22 through 25** depict the Upper Big Hole River TPA.

Weather patterns for the lower elevations are similar to those for Butte, Montana (elevation 5,549 feet). January has average temperatures of 28.4 degrees Fahrenheit for a high, and 4.2 degrees Fahrenheit for a low while July has average temperatures of 80 degrees Fahrenheit for highs, and 45 degrees for lows. Average annual precipitation is approximately 12 inches, with average annual cumulative snowfall 20 inches.

Annual precipitation levels for the higher elevations range from 20 to 30 inches, with annual snowfall averaging 36 to 60 inches.

The majority of the area is characterized by moderate (25 to 30 percent) to steep (50 percent) slopes, particularly along the Big Hole River corridor. Elevations (for BLM lands) range from approximately 5,200 to 7,200 feet. Upper to mid elevation north and east facing slopes are vegetated with sub-alpine fir, Douglas fir, spruce, and scattered aspen groves. Upper to mid-south facing slopes are vegetated with lodgepole pine. Low elevation, west and south facing slopes are vegetated with sage-

brush, lodge pole pine and occasional junipers. Vegetation along the Big Hole River corridor consists of sagebrush, willow, occasional cottonwood trees, and native grasses.

Existing Land Use

Recreation

Recreation use is well established in the Upper Big Hole River TPA, with fishing and big game hunting topping the list. The Big Hole River is one of Montana's finest trout streams, and has gained national recognition as a premiere fly fishing destination point.

From late May until the middle of June, fly-fisherman from all over the country come to the Big Hole for its "Salmon fly" hatch. The hatch begins around Twin Bridges and moves upstream as far as the East Bank Recreation site. The hatch moves 3 to 5 miles a day. The Big Hole River is the only river in the lower 48 states to host a large population of Arctic Grayling. The Big Hole hosts rainbow, brown, cutthroat, and brook trout. Rocky Mountain whitefish are also present.

Big game hunting is also well established in the Upper Big Hole TPA. The area receives use by local as well as non-resident hunters. Big game species include elk, mule deer, whitetail, antelope, black bear, mountain lion, and moose.

Other known recreational activities include: hiking, horseback riding, auto/OHV touring, upland game bird hunting, canoeing, kayaking, rock-hounding, gold panning, wildlife observation, and rock climbing (Humbug Spires).

A drive along the Big Hole River, from Divide west to Wisdom, and from Divide south to Twin Bridges, illustrates the importance of the Upper Big Hole to the regional economy. A number of motels, rental cabins, private/public campgrounds, restaurants, and outfitter and guide businesses are located along the river. A larger number of motels, sporting good stores, and outfitter and guide businesses located in the surrounding communities of Butte, Anaconda, and Dillon benefit directly from the Big Hole River as well.

This TPA contains 12 developed recreation sites (Divide Bridge CG, Sawmill Gulch TH, Divide Bridge Day Use, Titan Gulch, Jerry Creek Bridge, Dickie Bridge, Bryant Creek, East Bank, Sawlog Gulch, Pintlar Creek, Maiden Rock East, and Moose Creek TH) and two Special Recreation Management Areas (Upper Big Hole River and Humbug Spires). All remaining lands within the TPA are managed as part of the Butte FO Extensive Recreation Management Area.

Existing and potential Special Designations include Humbug Spires WSA, the Upper Big Hole eligible WSR, and the Humbug Spires potential ACEC.

Mineral/Energy Development

The Highland Mountains experienced both early placer production and later free-milling ore from lode mines producing gold silver copper, lead, and zinc. Rich ores were worked locally in arrastres or stamp mills or were shipped to local mills. Most production was recorded up to about 1937.

Moose Creek, Upper Camp Creek, and Soap Gulch each contained enough mineralization to classify as their own districts. Placer gold was worked intermittently but lack of high enough grades and sufficient water inhibited larger scale production. None of these areas carried sufficient grade or tonnage to yield larger scale profitable mines and production did not carry past the late 1930s.

Recent exploration has focused on placer deposits near the mouth of Soap Gulch and large scale targets for lead/zinc in the upper reaches of the drainage. A decorative slate operation is presently permitted in Soap Gulch. Phosphate from the Phosphoria Formation was produced on a larger scale in the area, and activity and interest have continued until recently.

Much of this area is strongly mineralized and may continue to see exploration and possible development in the future as commodity demands change over time.

Range Management

There are 42 grazing allotments in the Upper Big Hole TPA. The largest allotments are the Camp Creek Jerry Creek, and Copp-Jackson allotments. Due to the extended drought conditions, the amount of active grazing use has been reduced in the last 4 to 5 years. Grazing use may increase if wetter climate conditions return.

Forest Management

Approximately 30,000 acres of inventoried forest land that are managed by the Butte Field Office are located in the Upper Big Hole TPA. The general character of the vegetation is forested with large areas of cool, moist conifer and sub-alpine fir zones. The lower elevations and south facing slopes north of the Big Hole River are dominated by the dry conifer zone, mountain shrubs, or open grassy slopes. These are some of the most productive forest lands in the Butte Field Office. The forest stands are mainly second growth, having been heavily affected by harvesting and use starting with area settlement in the late 19th century and continuing through the present. There are few old growth stands and large wildfire events have not occurred since 1910. Most stands are considered to be commercial forest and have few current limitations or restrictions as to the silvicultural practices and treatment techniques that may be utilized for forest management. Exceptions occur in the Humbug Spires WSA which is managed under non-impairment guidelines for lands under wilderness review, and the forested areas in close proximity to the Big Hole River and the nearby recreational developments where visual

characteristics are important considerations in all management activities and vegetation treatments. The lands south of the Big Hole River are located in the Pioneer Mountain Landscape, where the joint landscape analysis was completed with the Beaverhead-Deerlodge National Forest in 1998.

Cultural/Historic

Cultural resources in the Upper Big Hole River valley reflect all of the ways of life that have been used since people have lived in Montana. Prehistoric Native American hunting sites and living areas are as old as 10,000 years. The most well-known resource in the area is the Nez Perce Trail, the path taken by Chief Josef and the Nez Perce tribe as they engaged the US Army in 1877. The formally recognized trail does not include land in the Butte Field Office management unit, but the Big Hole River provided a means of escape for the warriors and their families. There are tool material sites, rock features, shelters and various living areas that served a number of uses before the arrival of Europeans. After their arrival, site types diversified to include European activities – mostly related to mining and ranching.

Important Resource Issues

Wildlife

This TPA provides a diversity of habitat from low elevation grasslands/shrublands to high elevation cool, moist forests. Upper Big Hole Travel Planning area is the "Crown Jewel" of wildlife habitat in the Butte Field Office. The TPA consists of a wide variety of vegetation that provide habitat for a multitude of wildlife species.

Forests in the TPA provide habitat for species including but not limited to: elk, moose, mule deer, coyote, red fox, bobcat, cougar, black bear, mountain lion, pine marten, river otter, beaver, snowshoe hare, mountain cottontail, marmot, flying squirrel, red squirrel, long-tailed weasel, and other small mammals.

Forested lands in the eastern portion of the Travel Plan area, including the Moose Creek drainage, provide a transition zone from lower elevation winter range to higher elevation wet forest type used by black bear, lynx, gray wolf, beaver, mink, coyote, and other forest associated species.

Grasslands and sagebrush within the TPA provide habitat for elk, mule deer, pronghorn antelope, bighorn sheep, coyote, red fox, badger, mountain cottontail, ground squirrels, and other small mammals. To the east, the Soap Gulch and Camp Creek drainages are dominated by grassland and sagebrush that provide important habitat for grassland species and sagebrush obligates including species such as sage grouse and sage thrasher. Other BLM sensitive species found in these habitat types include: long-billed curlew, brewer's sparrow, Swainson's hawk, and golden eagle.

The TPA provides habitat for a diversity of forest and grassland bird species including but not limited to: pileated, hairy and downy woodpeckers, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, great-horned owl, blue grouse, hairy and downy woodpeckers, dusky flycatcher, pine siskin, western tanager, black-capped chickadee, red-breasted nuthatch, Townsend's solitaire, dark-eyed junco, Cassin's finch, pine siskin, red crossbill, western meadowlark, Swainson's hawk, red-tailed hawk, horned lark, mountain bluebird, and chipping sparrow.

BLM lands in the Big Hole Valley provide critical elk and mule deer winter range as well as calving habitat. BLM lands are within the transition zone between grassland/shrubland and forested habitats and provide essential habitat requirements for big game.

The eastern portion of the Travel Plan area also provides critical winter range for elk and mule deer as well as year round habitat for bighorn sheep.

Nearly the entire TPA is within core or subcore habitat. The Big Hole Valley provides a critical link from north to south and the east half of the Travel Plan area provides a corridor from the Highland Mountains to the Pintler/Pioneer Mountains. This corridor also provides for local daily movements and seasonal movements between higher elevation summer range along the Continental Divide and lower elevation winter range.

There are more known sightings of threatened, endangered and BLM sensitive species in this TPA than in any other area in the Field Office. Known sensitive species to occur in the PA include: arctic grayling, westslope cutthroat trout, boreal owl, boreal toad, spotted frog, tailed frog, wolverine, northern goshawk, pygmy rabbit, great gray owl, flammulated owl, four different bat species, fisher, sage grouse, sage thrasher, pileated woodpecker, golden eagle, Brewer's sparrow, long-billed curlew, and the bald eagle.

Threatened or endangered species know to occur in the Planning Area include; Canada lynx and the grizzly bear.

The higher cool, moist forest in the Travel Plan area provides habitat for the Canada lynx. Dry, mature Douglas-fir and lodgepole pine forest types at lower elevations provide habitat for the northern goshawk. Almost all the known nest sites for the northern goshawk in the Butte Field Office occur in the Big Hole watershed.

The Upper Big Hole Valley has the northernmost known population of pygmy rabbits.

Although the Planning area is not within a designated recovery or distribution zone for grizzly bear, the entire western half of the TPA, is considered to be high quality habitat for grizzly bear and sightings of grizzly bears often occur.

Aquatics/Fisheries

The Big Hole River is a world renowned trout fishery and is one of only a few free flowing rivers left in the west. The lower Big Hole is classified as a Blue Ribbon Fishery and hosts rainbow, brown, westslope cutthroat and brook trout. Rocky Mountain whitefish are also present. The river is refuge for the last wild population of fluvial Arctic grayling, a trout species now limited to the Big Hole River in the lower 48 states.

There are approximately 223 miles of perennial streams and 276 miles of fish bearing streams on all land ownerships in the TPA. Fish species found in the TPA include non-native brook, brown, rainbow trout, stocked Yellowstone trout and common carp. Native fish found in the TPA include: white sucker, longnose sucker, burbot, arctic grayling, westslope cutthroat trout, and mottled sculpin.

On BLM lands, there are approximately 41 miles of perennial stream, 19 miles of fish bearing stream and 31 miles of intermittent stream. Fish species found in the TPA include non-native brook, brown, rainbow trout, common carp and stocked Yellowstone cutthroat trout. Native fish found on BLM managed lands in the TPA include: white sucker, longnose sucker, burbot, arctic grayling, westslope cutthroat trout, and mottled sculpin.

As of 2003, there were 45 conservation populations of westslope cutthroat trout inhabiting 167 miles of stream within the Big Hole watershed. Almost all stream segments occupied by westslope cutthroat trout that showed no genetic introgression were classified as conservation populations.

In the Upper Big Hole TPA, there are 15 streams on BLM lands with westslope cutthroat trout and westslope cutthroat trout are found in approximately 19 miles of stream. Genetic testing has been conducted on cutthroat trout from eight streams; westslope cutthroat trout from Bear Creek and Fish Creek were found to 100 percent genetically pure.

Arctic grayling were once widespread in the Missouri River drainage upstream of Great Falls. During the 20th century, the range of fluvial grayling became restricted to the Big Hole River, which represents about four percent of its native range. The Montana Fluvial Arctic Grayling Restoration Plan was developed to recover fluvial Arctic grayling with the goal of at least five stable, viable populations distributed throughout at least three of the major river drainages within the historic range of Montana grayling. Reasons for decline of arctic grayling include: competition from non-native salmonids, overfishing, habitat degradation, drought, stream dewatering and irrigation diversions.

In the entire TPA there are seven streams with arctic grayling, and grayling are found in approximately 73 total miles of the seven streams.

In the Decision Area, arctic grayling are found within three streams in the TPA; the Big Hole River, Deep Creek, and LaMarche Creek. Arctic grayling are found within approximately 4.4 miles of stream on BLM lands.

In 1994, stretches of the river reached alarmingly low levels as drought conditions parched the region and irrigators diverted water for cattle and hay fields. That same year, the USFWS decided that protection of the grayling was "warranted but precluded" under the Endangered Species Act (ESA). In a 2007 ruling, the USFWS determined that listing was not warranted, as the fluvial arctic grayling does not constitute a distinct population segment as defined by the ESA. The river was also being considered by the Montana Department of Natural Resources and Conservation under a statute that called for identifying "chronically de-watered" rivers in the state. Such a designation would have meant installing measuring devices on all water diversions from the main stem of the river. The State of Montana precluded listing on the idea that cooperative efforts from local irrigators were needed to increase stream flows to 60 cubic feet per second (cfs). Ensuring a minimum in-stream flow for the long-term is necessary to protect a self-sustaining, healthy population of fluvial arctic grayling.

In 2004, the federal Natural Resources Conservation Service offered ranchers payment for not irrigating their hay meadows and pastures. The goal was to leave more water in the Upper Big Hole to aid in the survival of stream living grayling. During this year, the water level rose from 30 cfs to 159 cfs after irrigation stopped.

Water Resources

Montana's Big Hole River winds through the mountain ranges, steep canyons and rolling sagebrush prairie south of Butte. This un-dammed river runs over 150 miles from its headwaters above Jackson, elevation 7,340 feet, to its confluence with the Beaverhead and Ruby Rivers in Twin Bridges, where they form the Jefferson River at an elevation of 4,600 feet.

Although the Big Hole watershed encompasses nearly 1.8 million acres, only about 2,000 people live in the area, many of them making their living by ranching and hay farming. Other uses for land within the watershed basin include tourism, recreation, and outfitting. The Big Hole River is also a water source for the city of Butte.

Approximately 419,946 acres of the Big Hole watershed are within the Butte Field Office with 61,236 acres (15 percent) managed by BLM, 209,147 acres (50 percent) of USFS lands, 46,074 acres (11 percent) state lands, and 103,489 acres (25 percent) of private lands.

Thirty-six water bodies in the Big Hole Watershed are on the draft MDEQ 303(d) list for a wide range of reasons including, but not limited to, metals contamination, flow alteration, habitat alteration, siltation, and streambank destabilization. Approximately 26.6 miles of

streams listed as impaired flow through BLM lands in this TPA.

Riparian

The Upper Big Hole River TPA includes approximately 90 miles of riparian areas divided into 137 riparian reaches on BLM land. Some of the reaches were affected by historical mining, logging, and grazing regimes. Current condition ratings on these reaches include 50.2 miles in Proper Functioning Condition, 36.8 miles Functioning-At-Risk condition, and 1.5 miles in non-functioning condition. Trends on most reaches are upward or static.

Currently, the roads and trails having the biggest impacts on riparian conditions in this TPA are the roads along Camp Creek, Soap Gulch, McLean Creek, Moose Creek, Bear Creek, Sawlog Gulch, and Charcoal Gulch. Mitigation work has been conducted on all of these roads; however they all affect stream channels and sediment delivery to some degree.

Sensitive Plants

Three BLM sensitive plant species—*Lemhi beardtongue (Penstemon lemhiensis, Sapphire rockcress (Arabis fecunda), and Idaho sedge (Carex idahoa)*—are known to occur within the Upper Big Hole River TPA.

Noxious Weeds

The primary noxious weeds in the Upper Big Hole River TPA are spotted knapweed, leafy spurge, yellow toadflax, Dalmatian toadflax, houndstongue, and Canada thistle. Small, isolated infestations of oxeye daisy and diffuse knapweed have been observed. Some undesirable, invasive species found include common mullein, black henbane, and musk thistle.

Soil

Soils are derived mainly from three types of parent material, Limestone, Granite and mixed materials, mostly argillites. Limestone soils are the least erosive and the most stable. They are mainly very gravelly loams. Granite soils are the most erosive and least stable and are mainly cobbly sandy loams. Soils from mixed parent materials (argillites) are intermediate in erosiveness and stability between limestone soils and soils from mixed parent material.

Summary Public Scoping Comments

A public scoping meeting was held for the Upper Big Hole TPA on November 15, 2004. The meeting was attended by four local residents. The majority of comments received concerned the adverse effects of motorized use on big game hunting. Several comments were made expressing concern over "too much motorized access", and advocated reducing road density by closing redundant roads/trails, as well as designating specific non-motorized walk-in hunting areas. None of the comments received advocated increasing motorized use. The overall tone of the comments was to maintain the "primitive" character of the Upper Big Hole River corridor and adjacent lands. Other issues and concerns discussed during the meeting included:

- Interagency Coordination – Maintain interagency connectivity and coordination with USFS and other adjacent agencies.
- Enforcement - Proactive law enforcement, increased uniformed patrols by BLM staff to ensure compliance with completed travel plan.
- Maps/Signs - Provide quality travel plan maps and designated route signs.
- Public Access- Seek public access (easements) to Alder Creek and Tie Creek.

Lands and Realty

The Butte Field Office (BFO) Lands and Realty program is responsible for management of land use authorizations including right-of-way grants, road use agreements, land use permits, leases, and easements; land ownership adjustments including land acquisition, disposal, exchange, transfer, and donation; access to BLM land; land withdrawals; and unauthorized use including trespass identification and abatement. The Lands and Realty program supports other BFO resource management programs and occasionally those of local, state, and other federal agencies. BLM land with unique or special values can be designated for specific purposes such as recreation development, and for cultural, historic, or other resource value protection. BLM can provide land for community expansion through public sale or exchange. BLM can also provide land for recreation and public purpose uses. Examples include, but are not limited to schools, community buildings, municipal/law enforcement facilities, hospitals, fire stations, parks, and recreation sites.

The 1984 Headwaters RMP encompassed 311,337 surface acres and 655,505 acres of federal mineral estate located in nine counties in west-central Montana including Broadwater, Cascade, Gallatin, Jefferson, Lewis and Clark, Meagher, Park, Pondera, and Teton (USDI-BLM 1983).

In April 1993, District Office (Field Office) jurisdictional boundaries were adjusted. The BFO now has the management responsibilities for eight counties: Broadwater, Deer Lodge, Gallatin, Jefferson, Lewis and Clark (southern portion), Park, Silver Bow, and a portion of Beaverhead County along the Big Hole River (**AMS Figures 2-27a, 2-27b, and 2-27c**).

Most of the BLM land (89 percent) is located in four counties, Broadwater, Jefferson, Lewis and Clark, and Silver Bow (**Table 3-26**). Most of the producing agricultural land in the resource area was patented under homestead laws, most known mineral land was patented under mining laws, and most of the forested land was withdrawn for administration by the USFS.

Table 3-26 Public Land by County in the Decision Area	
County	**Acres**
Broadwater	70,679
Deer Lodge	5,227
Gallatin	7,250
Jefferson	94,397
Lewis and Clark (southern portion)	63,510
Park	8,365
Silver Bow	45,221
Beaverhead (portion along Big Hole River)	12,660
Total Acreage	**307,309**

Some large blocks of BLM land still exist, but in general, historic disposal policies have resulted in a scattered land ownership pattern. Some of the BLM land consists of isolated tracts surrounded by private land or the tracts are situated next to National Forest Land. It is common to find very small BLM parcels among patented mining claims.

Land Use Authorizations

The BFO analyzes requests for land use authorizations on a case-by-case basis and through the environmental review process, and applies mitigation measures and Best Management Practices.

Land use authorizations on BLM land include right-of-way grants; road use agreements; temporary use permits under several different authorities; leases, permits under Section 302 of FLPMA; airport leases under the Act of May 24, 1928; and Recreation and Public Purposes (R&PP) Act leases. For the purposes of this planning effort, R&PP patent transfers, unlike R&PP leases, are considered "land ownership adjustments" and are covered below under that heading.

The BFO administers approximately 554 rights-of-way, which encumber over 40,837 acres of BLM land (USDI-BLM 2004d). These existing grants are for a myriad of different facilities and are held by private individuals and groups as well as various business and government entities. Rights-of-way for roads, telephone lines, electric transmission lines, and pipelines constitute a major portion of existing land uses and requests for new authorizations. Various types of road rights-of-way are the most common types, accounting for 53 percent or over half of the total number of grants. Examples of additional types of rights-of-way facilities authorized within the Decision Area (DA) include water pipelines, communication sites, ditches, railroads, material sites, fiber optic lines, and a Montana Army National Guard training site. The BFO processes approximately 10 to 15 right-of-way actions annually. These include right-of-way applications for new facilities as well as amendments, assignments, renewals, or relinquishments of existing right-of-way grants. Communication Sites and Utility Corridors are discussed below in a subsequent section.

The BFO administers seven FLPMA Section 302 leases involving about 910 acres of BLM land. This includes 904.91 acres at Great Divide Ski Area and 3.9 acres at Holter Lake Lodge under commercial occupancy lease, and a total of 1.39 acres for five occupancy leases. There are no permits or easements under Section 302 of FLPMA or airport leases located within the DA. One R&PP lease has been issued under Section 212 of FLPMA to the Last Chance Handgunners involving 39.1 acres (USDI-BLM 2004i). R&PP patent transfers are discussed below under the section Land Ownership Adjustment.

One of the larger tracts of BLM land, approximately 20,000 acres in the Limestone Hills west of Townsend, is utilized under a right-of-way grant to the Montana Army National Guard for military training purposes (USDI-BLM 1984b). The 30-year right-of-way was granted in 1984 and expires in 2014. Eighty-eight percent of the land in the training area is administered by the BLM, with the remainder under state and private ownership (USDI-BLM 2004e). Military training over the years has resulted in unexploded ordnance (UXO) contamination, particularly within the interior 5,000-acre impact area. Based on BLM policy, the BFO implemented an emergency closure on the impact area. The Montana Army National Guard was also advised that its right-of-way for the range would not be renewed upon expiration in 2014, and the only way to assure its continued use of the area was through a military withdrawal. In September 2003, the Department of the Army announced its intent to prepare a legislative EIS for the withdrawal of the approximately 20,000 acres of BLM land that support training exercises at the Limestone Hills Training Area.

Renewable Energy

Renewable energy includes solar power, wind, biomass, and geothermal resources. As demand has increased for clean and viable energy to power the nation, consideration of renewable energy sources available on public lands has come to the forefront of land management planning.

In cooperation with the National Renewable Energy Laboratory (NREL), the BLM assessed renewable energy resources on public lands in the western United States (BLM and DOE 2003). The assessment reviewed the potential for concentrated solar power, photovoltaic, wind biomass, and geothermal energy on BLM, BIA, and Forest Service lands in the west. Hydropower was not addressed in the BLM/NREL report.

Concentrating Solar Power (CSP): This technology uses sunlight concentrated on a single point to generate power. The BLM/NREL study indicates that the potential for this type of renewable energy lies primarily in states to

the south and southwest of Montana. No BLM lands within the DA were identified as having potential for this type of energy source. In keeping with this assessment, the BFO has not had any expressions of interest in developing CSP facilities on public lands.

Photovoltaics (PV): Photovolaics technology makes use of semiconductors in PV panels (modules) to convert sunlight directly into electricity. The BLM/NREL study did not identify the BFO as one of the top 25 PAs for PV potential. To date, the BFO has not authorized any PV facilities strictly for commercial power production, nor has any interest been expressed by industry in developing such facilities on BLM lands.

Wind Resources: Wind power classes range from one (lowest) to seven (highest). BLM-managed lands in approximately 13 percent of the DA are Class 3 and higher. The BLM/NREL study did not identify the BFO as one of the top 25 PAs for wind energy potential The Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2004b) categorizes BLM-administered lands into areas having low, medium, or high potential for wind energy development from 2005 through 2025, on the basis of their wind power classification. Wind resources in Class 3 and higher could be developed economically with current technology over the next 20 years. Class 3 resources have medium potential; resources in Classes 4 and higher have high potential. The Programmatic EIS identifies scattered public land parcels in the DA with medium or high wind resource potential that might be developed economically with current technology. **Map 40** shows lands within the DA with Class 3 or higher wind power potential.

Two sites in the BFO have been seriously considered for development by the private sector. One is on BLM lands south of Interstate 90 at Livingston, where a previous wind power project was located in the 1980s (**Map 40**). Park County has turbines on private land next to BLM at this location. The other site is at the Golden Sunlight Mine at Whitehall. Wind data is being collected there under a BLM permit at the present time.

Guidelines from the Wind Energy Development Programmatic EIS (ROD signed December 2005) would be used when considering wind energy projects on BLM land.

Biomass: The BLM/NREL study identified the BFO as one of the top 25 BLM planning units having high potential for biomass resources. However to date, utilization of small diameter forest material has been sporadic at best to non-existent. This is due to long haul distances to pulp facilities and low return pulp markets. Some of this material is used through personal use firewood permits. Utilization of this material for biomass related energy production has not been a factor. No such facility exists in this region. Use of small diameter wood products or residue is currently encouraged when possible.

Geothermal: Geothermal resources are addressed under the *Energy Minerals-Fluid Leasable Minerals* section through the RMP.

The BFO has received inquiries from several individuals and companies regarding renewable energy projects. One of the primary limiting factors in site selection is access to power transmission interconnects, as well as acquisition of permits and power purchase agreements between the producer and owner of the power lines.

Land Ownership Adjustment

Land ownership adjustment refers to those actions that result in the disposal of BLM land and/or the acquisition of non-federal land or interest in land.

Current planning guidance with respect to land ownership is provided by the 1984 Headwaters RMP and the 1979 Dillon MFP. Further and more specific guidance was provided by the "Land Pattern Review and Land Adjustment, Supplement to the State Director Guidance for Resource Management Planning in Montana and the Dakotas, 1984" (USDI-BLM 1984b). This guidance was later amended by the 1989 State Director's guidance pertaining to access (see the *Access* section below). This direction established land exchange as the predominant method of land ownership adjustment. It also established retention, disposal, and acquisition criteria to be used in categorizing public land. Criteria in the supplement were used to identify retention and disposal zones within the DA.

There are approximately 298,944 acres (97 percent) of BLM land located within retention zones in the DA. These retention zones typically include the better blocked BLM lands that meet retention criteria. Although land in retention zones can be disposed of when significant public benefits are realized, the goal, generally, is to retain or enhance BLM land holdings within these zones. Land outside these retention zones is generally available for the full range of land ownership adjustment opportunities – including retention, exchange, sale, or transfer. Land ownership adjustment proposals in the DA are analyzed in project specific reviews using the aforementioned guidance.

The primary means of land ownership adjustment within the DA has been through exchange. Thirteen exchanges affecting BLM land and/or non-federal land within the PA have been completed since the implementation of the Headwaters RMP in July 1984.

The BFO has been using exchanges to improve public land ownership patterns by generally disposing of small, isolated tracts of BLM land with limited resource values and acquiring non-federal land with higher resource values adjacent to larger blocks of BLM land. Land in the DA has also been used in exchanges mandated by Congress for other agencies. During this same time

period, the BFO completed four Land and Water Conservation Fund purchases: one in the Devil's Elbow area, two associated with Crimson Bluffs, the McMasters Ranch, and one on the Ward Ranch near Hauser Lake. Eight donations to the government were also processed: three for recreation sites (White Sandy, Log Gulch, and Holter Dam), three during the acquisition of Ward Ranch, and two during the acquisition of the Iron Mask property. The BFO completed three land sales, one southeast of Mount Helena, one near Montana City, and one east of Holter Lake.

Table 3-27 lists land ownership adjustment actions for the PA since the approval of the Headwaters RMP in July 1984.

Table 3-27
Land Ownership Adjustment Actions Since July 1984 in the Decision Area

Type of Action	Number of Actions	Acres Disposed	Acres Acquired
Public Sales	3	10	0
Purchases	4	0	140
LWCF Purchases	9	0	8,987
Donations	7	0	2,352
R&PP Patent transfers	5	1,168	0
Land Exchanges	13	23,290	18,895
Total Acres		**24,468**	**30,374**

Note that acreages are approximate.

The R&PP Act authorizes the issuance of a land patent, with reversionary provisions, for BLM land when it serves the public interest. The BFO completed five R&PP patent transfers since approval of the Headwaters RMP.

These are:

- 34.09 acres to the MFWP for a recreation site.
- 40 acres in Lewis and Clark County for a sewage treatment area.
- 71.62 acres to Jefferson County for a warehouse and storage area.
- 400 acres to Broadwater County for a shooting range.
- 622.38 acres to MFWP for expansion of the Beartooth State Wildlife Management Area.

During this same time period, no lands have been conveyed for agricultural entries under the Desert Land Act or Carey Act, nor have any lands been conveyed for airport grants, Indian allotments, color-of-title actions, railroads, or state grants.

Access

For the purposes of this section, access refers to the physical ability and legal right of the public, agency personnel, and authorized users to reach public land. The lands and realty program primarily assists in the acquisition of easements to provide for legal access where other programs have identified a need.

Access to BLM land is an issue of concern to both agency personnel and the public. The PA's existing fragmented ownership pattern of BLM land, intermingled with private, state, and other Federal land, complicates the access situation. While the BFO has and is currently making progress in terms of improving access to public lands, there are still areas within the PA that lack legal access. Current planning guidance with respect to access is provided by the Headwaters RMP as supplemented by guidance prepared by the Montana State Office on access (USDI-BLM 1989a).

In accordance with guidance in this latter document, the BFO has been focusing its access acquisition efforts on:

- Larger blocks of BLM land, which are designated for retention in BLM ownership.
- Areas with important resource values.
- Areas where public demand for access is high.
- Areas with substantial BLM investments.

Generally speaking, access is acquired from willing landowners on a case-by-case basis as needs or opportunities arise, using criteria and direction provided in the guidance referred to above.

The BFO uses acquisition of road and trail easements as the primary means of obtaining legal access to public lands where it does not currently exist. There are three types of easements: exclusive easements, where the BLM acquires full public rights to the road in perpetuity and exclusively manages all other road uses; nonexclusive easements, where the BLM acquires only the right to use the road in perpetuity but does not control other uses; and temporary easements, where the BLM acquires the right to use the road for only a fixed period.

Since 1984, the BFO has acquired 40 permanent exclusive easements, which provide legal access to BLM land for the U.S. and its assignees, licensees, permittees, and the general public. The BFO has acquired six permanent non-exclusive easements, which provide legal access to BLM land but usually do not include access for the general public. The BFO has also acquired 11 temporary easements, encroachment permits and easements or permanent easements for specific projects such as fences, livestock or water pipelines and troughs (USDI-BLM 2004d).

Since the completion of the Headwaters RMP in 1984, the BFO has acquired access-related easements at the average rate of about four per year. When possible,

emphasis for easement acquisition is on those roads or trails identified through a route analysis process.

Most of the larger tracts of BLM land have legal public access via existing federal, state, and county road systems. Many smaller tracts of BLM land do not have legal access. In most cases, such parcels do not have resource values to justify public interest in acquiring access. Some small tracts of BLM along rivers serve as important public access points and require protection of existing legal access or acquisition of new legal access.

Although used much less frequently than easement acquisition, the BFO uses land exchanges on occasion to acquire needed access to public lands. Access is typically just one of many benefits of these exchanges. The consolidation of BLM land ownership patterns by exchange has generally improved the access situation in the DA. When disposing of BLM parcels containing roads or trails necessary for access to other federal land, the BFO protects these access routes by reserving access rights in conveyance documents.

Withdrawals

A withdrawal is a formal action that sets aside, withholds, or reserves Federal lands by administrative order or statute for public purposes. The effect of a withdrawal is to accomplish one or more of the following:

- Segregates (close) Federal land to the operation of all or some of the public land laws and / or mineral laws.
- Transfers total or partial jurisdiction of Federal land between Federal agencies.
- Dedicate BLM land for a specific public purpose.

Withdrawals can be categorized into three major types including:

- Congressional – legislative withdrawals made by Congress in the form of public laws. Examples include designation for wild and scenic rivers or wilderness.
- Administrative – withdrawals made by the President, Secretary of the Interior, or other officers of the executive branch of the Federal Government. Examples include stock driveways, resource protection, and public water reserves.
- Federal Power Act – power project withdrawals established under the Federal Power Act of June 10, 1920. These withdrawals are automatically created upon the filing of an application for hydroelectric power development with the Federal Energy Regulatory Commission (FERC).

There are approximately 6,300 BLM surface acres in the DA with some type of withdrawal on them. Types of withdrawals are described below.

BLM Recreation Sites: The BFO currently has one recreation site which is administratively withdrawn. Devil's Elbow Recreation Site is withdrawn from surface disposal and mining, but not from mineral leasing.

Public Water Reserves: These include a number of administrative withdrawal actions over the years for spring areas set aside for public use. These areas are scattered throughout the DA and are withdrawn from surface disposal and nonmetalliferous mining, but not from metalliferous mining and mineral leasing.

BLM Protective Withdrawals: This includes administrative withdrawals on lands acquired for wetland, riparian, recreation, and wildlife values. These lands are generally withdrawn from surface disposal and mining, but not from mineral leasing.

USFS Administrative Sites: These are administrative withdrawals for U.S. Forest Service administrative sites located outside Forest Service boundaries.

Power Site Reserves and Classifications: There are numerous power site reserves and classifications within the DA. These are administrative withdrawals that protect water/power development potential. Generally speaking, these sites are withdrawn from surface disposal only.

FERC Power Project: These withdrawals are administered by FERC. Lands included in an application for hydroelectric power development with FERC are automatically segregated from surface disposal. At the time FERC issues a license or preliminary permit, the lands are automatically closed to location and entry under the mining laws, but are still available for mineral leasing.

The BFO considers requests for new withdrawals and withdrawal revocations, extensions, or modifications on a case-by-case basis. Existing withdrawals are reviewed on a case-by-case basis prior to the end of the withdrawal period or as otherwise required by law to determine whether they should be extended, revoked, or modified.

It should be noted that while BLM land classifications are not formal withdrawals, they are considered "de facto" withdrawals since most land classifications also segregate public lands from the operation of all or some of the public land laws and/or mineral laws. A BLM land classification accomplishes one of the following:

- Determines if BLM land is suitable for certain types of entry (disposal or lease) under the public land laws (for example, R&PP Act leases and patents).
- Determines if BLM land is suitable for retention for multiple-use management.

Historically, much of the DA was under classification for retention for multiple-use pursuant to the Classification and Multiple Use Act (C&MU) of 1964. With the passage of FLPMA in 1976 and its direction that BLM lands generally be retained in public ownership, these C&MU classifications within the DA were deemed unnecessary and were terminated.

Any new classification actions since the completion of the 1984 Headwaters RMP have been in response to R&PP Act lease or patent applications or sale actions.

In September 2003, the Department of the Army announced its intent to prepare a legislative EIS for the withdrawal of approximately 20,000 acres of land that support training exercises at the Limestone Hills Training Area. The BFO is currently processing an application for the military withdrawal of 20,000 acres at the Limestone Hills Training Area and is a cooperating agency for the project EIS. A draft of the EIS is scheduled to be completed in the spring of 2007.

Unauthorized Use

Trespass actions under the Lands and Realty program can be split into three separate categories. These include:

- Unauthorized Use.
- Unauthorized Occupancy.
- Unauthorized Development.

Unauthorized use refers to activities that do not appreciably alter the physical character of the public land or vegetative resources. Some examples of unauthorized use include the abandonment of property or trash, enclosures, and use of existing roads and trails for purposes that require a use fee or right-of-way. Unauthorized Occupancy refers to activities that result in full or part-time human occupancy or use. An example would be the construction, placement, occupancy, or assertion of ownership of a facility or structure (cabin, house, natural shelter, trailer, etc.). Unauthorized Development means an activity that physically alters the character of BLM land or vegetative resources. Examples include cultivation of public lands, road or trail construction or realignment, or unauthorized utility construction.

The BFO attempts to abate trespass through prevention, detection, and resolution. In the Lands and Realty program, priority for resolving trespass in the DA is accorded to those newly discovered ongoing uses, developments, or occupancies where resource damage is occurring and needs to be halted to prevent further environmental degradation. Lesser priority is accorded to those historic trespass cases where little or no resource damage is occurring. Lands and Realty trespass cases in this latter category are resolved as time permits.

Communication Sites and Utility Corridors

Twenty communication site rights-of-way occupying seven different communication site locations are authorized within the DA (**AMS Figure 2-28** and **Table 3-28**).

Potential new users are encouraged to locate at the existing sites within existing facilities. Communication site plans exist for all seven sites.

Table 3-28
Communication Sites and Locations in the DA

Communication Site	Legal Description (Principle Meridian, Montana)
Boulder	T.6N., R.4W., Sec. 19, SE¼ NW¼
Bull Mountain	T.2N., R.3W., Sec. 18, SW¼ SE¼
Limestone Hills	T.6N., R.1E., Sec. 20, NE¼ NW¼
Montana City	T.9N., R.3W., Sec. 25, W½ NW¼
Mount Belmont	T.12N., R.6W., Sec. 34, Lot 9
Toston	T.4N., R.3E., Sec. 8, SE¼ NW¼
Wickes/Boulder Hill	T.7N., R.4E., Sec. 28, Lot 10

The DA is traversed by a number of rights-of-way that are authorized for utility uses. In accordance with the direction provided in the Headwaters RMP, attempts are made to group compatible right-of-way facilities where feasible. However, the BFO currently has no formally designated right-of way corridors.

SPECIAL DESIGNATIONS

Special designations include Wilderness Areas, Wilderness Study Areas, Areas of Critical Environmental Concern, Research Natural Areas, Outstanding Natural Areas, National Recreation Areas, Back Country Byways, National Trails, watchable wildlife viewing sites, and Wild and Scenic Rivers.

There are no Research Natural Areas, Outstanding Natural Areas), National Recreation Areas, Back Country Byways, watchable wildlife viewing sites, or known caves of significance in the Decision Area. No rivers in the PA are currently managed under the Wild and Scenic Rivers Act of 1968. Indicators used to assess change to special designation areas are:

- Changes to administrative designations: consider changes to the number and type of areas, access to areas, and location of areas.
- Changes in availability of special areas in surrounding vicinity (outside Decision and PAs).

Areas of Critical Environmental Concern

Areas of Critical Environmental Concern are unique to the BLM. BLM regulations (43 CFR Part 1610) define an ACEC as an area "within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards." While an ACEC may emphasize one or more unique resources, other existing multiple-use management can continue

within an ACEC so long as the uses do not impair the values for which the ACEC was designated.

Laws, Regulations and Policies

Section 202(c)(3) of FLPMA mandates the BLM to give priority to the designation and protection of ACECs in the development and revision of land use plans. BLM Manual 1613 (USDI-BLM 1980a) describes the process followed to nominate ACECs and screen areas for their suitability or ACEC designation. The BLM's planning regulations (43 CFR 1610.7-2) establish the process and procedural requirements for designating ACECs in RMPs and RMP amendments.

Existing ACECs

The 11,679-acre Sleeping Giant ACEC is adjacent to the Holter Lake Recreation Area complex and is primarily comprised of the Sleeping Giant WSA and Sheep Creek WSA (**AMS Figure 2-26**). The area is characterized by the same values discussed in the Wilderness Study Area section above.

National Trails

Portions of the Continental Divide National Scenic Trail and the Lewis and Clark National Historic Trail are in the Decision Area. About 226 miles of the Continental Divide National Scenic Trail traverse the PA, less than three miles of which are located within the Decision Area. Approximately 210 miles of the Lewis and Clark National Historic Trail traverses the PA along the Missouri, Jefferson, Gallatin and Yellowstone Rivers, as well as a cross-county segment from Belgrade to Livingston. BLM manages about 34,000 acres of public land along this national trail in close cooperation with the public and other federal, state, and local agencies under the Missouri/Madison Comprehensive Recreation Plan. BLM provides multiple public interpretative services throughout this corridor including numerous site location signs, the self-guided Two Camp Vista facility on Hauser Lake and partnership contributions to the Gates-of-the-Mountains kiosks on Holter Lake.

Wild and Scenic Rivers

No rivers in the Decision Area are currently managed under the Wild and Scenic Rivers Act of 1968 (Public Law 90-542, as amended; 16 USC 1271-2287). The Wild and Scenic River Act was enacted by Congress to provide a national policy for preserving and protecting selected rivers and river segments in their free-flowing condition for the benefit and enjoyment of present and future generations. Section 5(d)(1) of the Act directs federal agencies to consider potential wild and scenic rivers in their land and water planning processes.

As part of the land use planning process for the Butte RMP, the BLM interdisciplinary team analyzed all river and stream segments in the PA that might be eligible for inclusion in the NWSRS. This included screening all PA rivers to identify those with BLM surface ownership. In addition, BLM coordinated with other federal and state river administering agencies and consulted applicable source listings such as the NPS Nationwide Rivers Inventory and the American Rivers Outstanding Rivers List. These initial screening and identification efforts resulted in a list of 164 rivers or river segments for further consideration in the inventory process.

Additional review focused on whether these 164 segments meet free-flowing criteria and contain any outstandingly remarkable values, as defined in the Wild and Scenic Rivers Act. Of the 164 river segments, four segments totaling 12 miles meet the eligibility criteria. These include segments on the Big Hole River, Missouri River, Moose Creek, and Muskrat Creek. Tentative classifications were assigned to each eligible segment as follows: Big Hole River – Recreational; Missouri River – Scenic; Moose Creek – Scenic; and Muskrat Creek – Scenic. See **Map 32** and **Appendix J – Wild and Scenic Rivers** for additional information.

Wilderness Areas

No BLM designated Wilderness Areas exist within the Decision Area. Portions of five Wilderness Areas administered by the USFS are located within the PA. No additional BLM lands other than Wilderness Study Areas described below have wilderness characteristics.

Wilderness Study Areas

There are six existing Wilderness Study Areas in the Decision Area (**AMS Figure 2-26** and **Table 3-29**). Under FLPMA, Congress directed BLM to inventory, study, and recommend public land under its administra-

Table 3-29
Wilderness Study Areas

Name	Number	Total Acres	Acres Recommended for Wilderness
Humbug Spires	MT-ISA-003	11,320	9,648
Sleeping Giant	MT-075-111	6, 666	6,666
Sheep Creek	MT-075-11B	3,801	3,801
Black Sage	MT-075-115	5,917	5,917
Elkhorn Tack on	MT-075-114	3,575	3,575
Yellowstone River Island	MT-07-133	69	69

tion for wilderness characteristics. All Decision Area lands were inventoried for wilderness characteristics; no new lands acquired since the last wilderness review contain lands with wilderness characteristics. Section 603 of FLPMA requires the BLM to provide Congress with recommendations as to suitability or unsuitability of BLM Wilderness Study Areas (roadless areas greater than 5,000 acres and roadless islands) for Wilderness designation. Only Congress can ultimately decide which areas, if any, will be designated as Wilderness and added to the National Wilderness Preservation System.

Sleeping Giant

The Sleeping Giant WSA consists of 6,666 acres. It was originally established in 1981, removed from further wilderness consideration in 1982, reinstated as a WSA in 1985, and enlarged in 1988 (USDI-BLM 1991a). It has steep, irregular topography with elevations ranging from 3,600 to 6,800 feet and is adjacent to the Holter Lake Recreation Area complex. The Sleeping Giant formation is a well-known landmark visible from Helena. About half the area is forested. Seven miles of ridgeline hiking routes offer panoramic views of the Rocky Mountains. A portion of the Sleeping Giant area is part of the Lewis and Clark National Historic Trail. Several deteriorating structures near the river evoke the lifestyles of early settlers (USDI-BLM 1991a).

The Wilderness suitability study recommended the Sleeping Giant for Wilderness designation (USDI-BLM 1991a); this has been forwarded to Congress. This area is managed under the Interim Management Guidelines.

Sheep Creek

Sheep Creek, a 3,801-acre WSA established in 1988, is immediately west of and adjacent to the Sleeping Giant WSA. The two areas are separated by a power line and associated maintenance road. Sheep Creek is characterized by steep topography with elevations ranging from 4,100 to 6,600 feet. About half the area is forested (USDI-BLM 1991a). The Wilderness suitability study recommended Sheep Creek for Wilderness designation (USDI-BLM 1991a). This WSA is being managed under the Interim Management Guidelines.

Black Sage

Black Sage is a 5,917-acre WSA established in 1981. All sides of the area are bordered by private land, and there is no legal public access. The area is characterized by rolling hills with elevations from 5,000 to 6,000 feet. Approximately 40 percent of the area is vegetated with juniper, mountain mahogany Douglas-fir and limber pine; the remainder is comprised of grasses and sagebrush. No perennial water sources occur in the area, and there are no dominant features except for a forested ridge face in the central portion of the area. The Wilderness suitability study and EIS recommended the area as unsuitable for Wilderness designation (USDI-BLM 1986); this has been forwarded to Congress. This Wilderness Study Area is managed under the Interim Management Guidelines.

Elkhorn Tack-on

The Elkhorn Tack-on WSA was established in 1979. This WSA totals about 3,575 acres. The area is characterized by dense forests of lodgepole pine, Douglas-fir and ponderosa pine, three perennial streams and mountainous terrain (USDI-BLM *et al.* 1995). The BLM Elkhorn WSA is located immediately adjacent to the 64,522-acre Elkhorn Inventoried Roadless Area that is administered by the USFS. Because the portion located on BLM land is less than 5,000 acres, it is considered to be a Section 202 (FLPMA) tack-on to the USFS area. A Wilderness suitability study has not been completed. The Elkhorn WSA is being managed under the Interim Management Guidelines.

Yellowstone River Island

Established in 1981, the Yellowstone River Island WSA is comprised of 69 acres. The area is roughly circular and about two thirds of a mile in diameter; the surrounding river frontage is private. The island is a relatively flat sand and gravel bar that varies from zero to ten feet above the river's low-flow level; the average elevation is 4,415 feet. The island's outer portions consist of cut banks and alluvial deposits formed by a very active portion of the Yellowstone River and, consequently, are constantly subject to change. The majority of the river now flows north of the island, whereas 50 years ago the majority flowed south. Vegetation is diverse and consists of dense pioneer shrubs (primarily willows) around the perimeter. The higher and more stable interior comprises about half of the island and is vegetated with cottonwood stands intermixed with open, grassy areas. There are several high-water channels within the WSA, some of which support marshy riparian vegetation. The Wilderness suitability study and EIS recommended the area as unsuitable for Wilderness designation (USDI-BLM 1986); this has been forwarded to Congress. The Yellowstone River Island WSA is being managed under the Interim Management Guidelines. There are no size requirements for islands.

SOCIAL AND ECONOMIC

TRIBAL INTERESTS

Indian Trust Resources are legal interests in assets held in trust by the federal government for federally recognized Indian tribes or nations or for individual Indians. Tribal treaties are negotiated contracts executed with the United States and are on essentially the same legal footing as treaties with foreign nations. Since the BLM manages portions of the ceded lands that are within the traditional use areas of the tribes, the BLM has a trust re-

sponsibility to provide the conditions necessary for Indian tribal members to satisfy their treaty rights and consider the potential impacts of BLM plans, projects, programs, or activities. Members of the tribes may exercise their hunting, fishing, and gathering rights on federal lands outside the boundaries of the reservation. Tribal members may also access and use places or resources that are important for religious or cultural reasons. Effective consultation and coordination with the tribes is necessary to identify any management issues with trust resources, treaty rights, or traditional or religious uses.

PUBLIC SAFETY

Abandoned Mine Lands

Mine wastes from historic mine sites now considered to be abandoned mine lands are a threat to human health and the environment. Abandoned mines also contain hazardous mine openings (HMOs) and physical safety hazards associated with historic mine operations and unstable slopes. Heavy metals associated with mine waste may pose a risk to human recreational users and to terrestrial and aquatic environments.

Old mine workings are found throughout Montana on land administered by BLM, USFS, and the State of Montana as well as on private land patented under the General Mining Law. Laws requiring the clean-up and proper closure of mines are relatively recent compared to this long history of mining law.

AMLs are inactive or abandoned mines located on or near public land where the owner or operator cannot be established, have no financial assets, or cannot assist with the reclamation of these mine sites. Mine waste present at abandoned or inactive mine sites generally include waste rock, mill tailings, and chemicals. Mine waste produced from the extraction or beneficiation of ore is considered exempt from hazardous waste regulations. The reclamation or clean-up of AML sites is often the responsibility of public land management agencies if an owner or operator of the AML site can not be determined.

The BLM began inventorying AML sites in 1993 and continues to inventory, assess, and add to the existing AML inventory data as new sites are identified. The AML inventory data is used to assist with the prioritization, funding, and continued reclamation of AML sites. AML sites identified in the inventory include those on or potentially impacting BLM lands and may range from small, insignificant sites to larger environmental or HMO sites. Some areas have not been inventoried and new HMOs are reported every year by BLM employees or the public. The BFO has reclaimed 11 abandoned mine sites considered to be a threat to human health and the environment because of water quality related issues on BLM lands since the beginning of the AML program in 1997. A total of 49 HMOs considered to be physical safety hazards have been reclaimed. Twenty-seven HMOs are presently being assessed, and 51 are scheduled for reclamation over the next five years. It is expected that up to 100 HMOs with associated physical safety problems may need to be assessed and reclaimed in the Decision Area during the next 20 years.

Hazardous Materials

Improper handling, storage, and disposal of hazardous material may pose a risk to recreational users and to terrestrial and aquatic environments (**Table 3-30**). Hazardous materials may legitimately be brought onto BLM land during weed control or resource development activities. The types of hazardous materials used for weed and insect control include herbicides and pesticides. The general types of hazardous materials that may be present during natural resource management include petroleum products (fuels and lubricants), solvents, surfactants, paints, explosives, batteries, acids, biocides, gases, antifreeze, and mineral products (mine waste, cement, and drilling materials).

Table 3-30
Activities and Associated Hazardous Materials

Potential Hazard	Examples
Hazardous materials associated with historic and active mine operations	Acid rock drainage; Chemicals associated with processing ore or used in laboratories (i.e., cyanide); Explosives such as dynamite, ammonium nitrate, caps, and boosters; Heavy metals; Asbestos
Military operation	Unexploded ordinances; Aircraft wreckage
Illegal dumping	Unauthorized landfills; Dumping of barrels or other containers with hazardous substances on public land
Illegal activities	Drug Labs; Wire burn sites
Spillage of hazardous materials	Materials spilled from overturned trucks or train cars
Oil and gas activities	Hydrogen sulfide gas; Oil spills
Facilities on public land, either federal or private (under a right-of-way)	Leaky underground storage tanks; Asbestos

Social and Economic Environment

The Butte FO manages lands distributed across eight contiguous counties. Potential social and economic effects associated with the draft RMP include changes in employment, income, and quality of life. These effects are likely to occur primarily in Jefferson, Broadwater, Lewis and Clark, and Silver Bow counties where the majority of PA lands are located. Although the effects are likely to be relatively small in Beaverhead, Deer Lodge, Gallatin, and Park counties, these counties are also included in the following discussion.

The following sections present a general overview of the social and economic conditions of the eight study area counties and provide a baseline that the potential effects of the alternatives may be measured against. The discussion is organized into two main sections that address social conditions and economic conditions, respectively.

Social Conditions

Social Trends

This section provides a brief overview of general social trends and changing attitudes toward public land management in western Montana.

The population in the eight county study area increased by 17 percent in the 1990s, compared to a 13 percent increase statewide, with net in-migration accounting for 72 percent of total growth in the study area counties. This is generally representative of the broader movement of people from urban areas to rural areas in western Montana that has been going on since the 1980s. In scenic areas, particularly those suitable for recreation, ranches are being sold for recreation uses or subdivided for homes. Some in-migrants buy smaller lots to ranch or farm but do not depend on economic return from the property as their primary source of income. Sometimes this in-migration has resulted in conflict between long-time rural residents and newcomers whose beliefs and values may challenge the existing way of life (USDI-BLM 2004j).

Social values associated with land and natural resources take many forms including commodity, amenity, environmental, ecological, recreation, spiritual, health, and security-related values (Stankey and Clark 1991). In the past, natural resource management has tended to emphasize commodity values. This emphasis has come into question in recent years and changing public attitudes toward the management of public lands and an increased emphasis on environmental protection have raised concerns in some parts of the West. Some groups have expressed concerns that changes in public land management are being driven by government officials and environmental advocates who do not have a true understanding of these lands or the people living nearby who depend on these lands for their livelihood and recreation. There is particular concern about the loss of traditional uses of the land such as livestock grazing and cross-country vehicle use (USDI-BLM 2004j).

Comments received during the Butte RMP scoping process expressed concern over the cumulative loss of public land to private ownership and the loss of public access to public lands through access closures. Concerns were also expressed that access to public land has already been reduced by land exchanges and land pooling processes (USDI-BLM 2005b).

Demographic Characteristics and Trends

Population

The eight-county study area had a total population of 206,900 in 2000, with county populations ranging from 4,385 in Broadwater County to 67,831 in Gallatin County. Major cities in the study area include Bozeman and Helena, with 2000 populations of 27,509 and 25,780, respectively. Butte is also a major city and regional center.

Montana is one of the least densely populated states in the country, with an average population density of 6.2 persons/mi^2 compared to a national average of 79.6 persons/mi^2. The eight-county study area had an average population density of 11.1 persons per square mile, with county population densities ranging from 1.7 persons per square mile in Beaverhead County to 48.2 persons per square mile in Silver Bow County.

Total population increased in seven of the eight study area counties in the 1990s, with the largest increases occurring in Gallatin (34 percent), Broadwater (32 percent), and Jefferson (27 percent) counties. The population in Silver Bow County, in contrast, increased by just 2 percent over this period, while Deer Lodge County experienced a net decrease in population. Much of the overall increase in population was due to net in-migration, with increases tending to occur primarily in unincorporated areas in most counties (MDOC 2004a).

Population projections developed by the State of Montana in 1997 anticipate continued population growth through 2010 in all of the study area counties, with the exception of Deer Lodge and Silver Bow counties where population is expected to decrease by about 6.6 and 6.4 percent, respectively. Population is expected to grow particularly rapidly between 2000 and 2010 in Jefferson (22 percent), Gallatin (18.6 percent), Broadwater (17.2 percent), and Lewis and Clark (15.2 percent) counties. Population growth is projected for all study area counties from 2010 to 2020, with total population in the eight-county area projected to increase by 11.8 percent (MDOC 2004b).

Race and Ethnicity

Approximately 89.5 percent of Montana's population identified as White in the 2000 census. American Indian and Alaska Natives were the largest minority group accounting for 6 percent of the total state population. All

eight study area counties had predominantly white populations, with more than 94.7 percent of the total study area population identifying as White in the 2000 census. Hispanics/Latinos were the largest minority population accounting for 1.8 percent of the total study area population (**Table 3-31**).

Income and Poverty

Per capita income, which is calculated by dividing total personal income by population, was lower than the statewide average in five of the eight study area counties in 2000, ranging from 83 percent to 99 percent of the state average in Broadwater and Silver Bow counties, respectively (**Table 3-32**). Per capita income in the remaining three counties ranged from 109 percent to 112 percent of the state average in Gallatin and Lewis and Clark counties, respectively.

The percent of the population below the poverty rate in 1999 was below the state average (14.6 percent) in five of the eight study area counties, ranging from 9.0 per

Table 3-31
Race and Ethnicity, 2000

County/State	2000 Population	Percent of Total Population					
		White	Black/African American	American Indian/ Alaska Native	Other Race[1]	Two or More Races	Hispanic/ Latino Origin
Beaverhead	9,202	94.4	0.1	1.4	0.3	1.1	2.7
Broadwater*	4,385	96.1	0.3	1.1	0.2	1.0	1.3
Deer Lodge	9,417	94.7	0.2	1.6	0.4	1.5	1.6
Gallatin	67,831	95.3	0.2	0.8	1.0	1.1	1.5
Jefferson*	10,049	95.2	0.1	1.2	0.5	1.5	1.5
Lewis and Clark*	55,716	94.4	0.2	1.9	0.6	1.4	1.5
Park	15,694	95.5	0.4	0.9	0.4	1.0	1.8
Silver Bow*	34,606	93.7	0.1	1.8	0.5	1.1	2.7
County Total	206,900	94.7	0.2	1.4	0.7	1.2	1.8
Montana	902,195	89.5	0.3	6.0	0.6	1.5	2.0

*RMP-related effects are most likely to occur in these counties, where the majority of the PA lands are located.
[1] The "Other Race" category presented here includes census respondents identifying as Asian, Native Hawaiian and Other Pacific Islander or Some Other Race.
Source: Social Science Data Analysis Network, 2004

Table 3-32
Per Capita Income by County, 1990 and 2000

County/ State	Per Capita Income		Share of Per Capita Income[1]					
			Earnings		Transfer Payments		Dividends, Interest and Rent	
	2000 ($)	% of State Average	% of Total	Change 1990-2000	% of Total	Change 1990-2000	% of Total	Change 1990-2000
Beaverhead	21,175	92	55	-1	19	1	26	0
Broadwater*	19,038	83	55	0	21	2	24	-2
Deer Lodge	19,641	86	51	2	26	-1	22	-1
Gallatin	25,139	109	66	4	9	-3	25	-2
Jefferson*	25,476	111	69	-2	12	0	19	2
Lewis and Clark*	25,623	112	55	-1	19	1	26	0
Park	20,469	89	53	3	18	-3	29	0
Silver Bow*	22,760	99	59	3	20	-1	21	-2
Montana	22,961	100	60	-1	19	1	26	0

*RMP-related effects are most likely to occur in these counties, where the majority of the PA lands are located.
[1] Personal income consists of net earnings by place of residence, transfer payments (including income maintenance payments, unemployment, and retirement benefits), and dividends, interest, and rent.
Source: U.S. Bureau of Economic Analysis, 2003a

cent in Jefferson County to 12.8 percent in Gallatin County.

The percent of the population below the poverty rate in the remaining three counties ranged from 14.9 percent to 17.1 percent in Silver Bow and Beaverhead Counties, respectively (**Table 3-33**).

Table 3-33
Percentage of Persons Below Poverty by County, 1999

County	Individuals Below Poverty Level
Beaverhead	17.1%
Broadwater*	10.8%
Deer Lodge	15.8%
Gallatin	12.8%
Jefferson*	9.0%
Lewis and Clark*	10.9%
Park	11.4%
Silver Bow*	14.9%
Montana	14.6%

*RMP-related effects are most likely to occur in these counties, where the majority of PA lands are located.
Source: U.S. Census Bureau, 2004a

Affected Counties

The following paragraphs provide a brief overview of the social and economic conditions in Broadwater, Jefferson, Lewis and Clark, and Silver Bow counties where the majority of the effects are expected to occur.

Broadwater County

Broadwater County has faced substantial growth since the 1980s. Growth pressures from Helena in adjacent Lewis and Clark County have affected the north end of the County, with growth in Three Forks/Gallatin County affecting the south portion of the county (Broadwater County Planning Board 2003).

The population in Broadwater County increased by 32 percent between 1990 and 2000 - the third highest increase in Montana. Much of this increase occurred in unincorporated areas, primarily on marginally productive agricultural land. Many new residents are attracted to communities with appealing environments and life styles. Long-term residents typically want to avoid increasing the current cost of building and living in the area (Broadwater County Planning Board 2003).

A scoping meeting for the Butte RMP was held in Townsend. Comments made during this meeting were largely concerned with weeds.

Jefferson County

Although historically important traditional resource-based industries—mining and ranching—continue to play an important role in Jefferson County's local economy, new residents are also attracted to the convenient location and scenic beauty of the area. Jefferson County identifies itself as the "undiscovered in-between", located between Butte and Bozeman and between Butte and Helena (Northern Economics 2003). Recent economic trends influencing the county include the influx of population and development spilling over from Helena into the north part of the county and the decrease in employment in the Golden Sunlight Mine in the south part of the county (Northern Economics 2003).

A scoping meeting for the Butte RMP was held in Boulder. Comments made during this meeting were concerned with grazing and fire/fuels management.

Lewis and Clark County

The economy of Lewis and Clark County is mainly based on government employment and services, with services emerging as an increasingly important component of the overall employment mix. Lewis and Clark County and the Helena/East Helena area, in particular, serve as an important regional center, with many workers commuting to work there from Jefferson and Broadwater counties. The Helena Valley continues to account for much of the total County population and growth, with the majority of recent and ongoing growth occurring within unincorporated areas in the valley (Lewis and Clark County Planning Department 2004).

A scoping meeting for the Butte RMP was held in Helena. Comments made during this meeting were largely focused on issues surrounding access to public lands and land ownership adjustments. Weed management and fuel management policies were also identified as areas of concern.

Silver Bow County

The Butte-Silver Bow area is rich in mineral resources and the area's colorful mining history has shaped almost all aspects of life in Butte-Silver Bow County. Population in Butte-Silver Bow has declined from a high of 60,313 in 1920 to just 34,606 in 2000. The social assessment prepared for the Beaverhead-Deerlodge National Forest planning process noted that Butte is currently in transition from being a one-company, working class, mining town, but does not appear to have identified a clear vision for its future. Butte is extremely pro-recreation and has a long history of conservation efforts (Northern Economics 2003).

Scoping meetings for the Butte RMP revision were held in Butte and Divide. Comments made during the Butte meeting were largely focused on issues surrounding access to public lands and land exchanges. Comments made in Divide, a small community located on the south edge of the county, were primarily concerned with potential impacts to grazing and the trade-off between environmental preservation and grazing rights.

Affected Groups

There are a number of different groups that could be potentially affected by the draft RMP. These groups may

be generally identified by their shared lifestyles and values. Lifestyle, as used here, may be broadly described as a combination of the activities, values, meanings, preferences, and ways of living in a particular place and time. Potentially affected groups include those associated with ranching, timber, and recreation, as well as permitted outfitters and guides, groups who give a high priority to resource protection, and groups who give a high priority to resource use.

The following brief discussions simplify what are often quite complex and unique values and attitudes and the groupings presented here are by no means mutually exclusive, with many ranchers, for example, also participating in recreation activities. It is also worth noting that personal attitudes, interests, and values often change over time.

Ranching

Ranching is an important part of the history, culture, and economy of the eight study area counties. Many ranchers in southwest Montana consider their work a "way of life", rather than simply a source of income (Northern Economics 2003). The land and their relationship to it is an important part of how they construct and evaluate their own identities, as well as those of their neighbors. Ranchers face many challenges today, including fluctuating cattle prices, increasing equipment and operating costs, and changes in federal regulations. Additional sources of income are often necessary to continue ranching and ranchers or their family members may also work as fishing guides or outfitters or elsewhere in town (Northern Economics 2003). There are currently 174 ranchers who lease Butte Field Office lands for grazing. For 20 of these ranch operations, the BLM lands account for more than one-third of their total AUMs.

Comments expressed during scoping for the Butte RMP included concerns about current livestock grazing and vegetation management programs, with comments stating that these programs are poorly managed and detrimental to vegetation, wildlife, foliage, and soil conditions. Other comments favored livestock grazing on public lands and improving forage for livestock, as well as wildlife. Others recommended that livestock grazing management be aimed at maintaining a sustainable grazing program that protects range and riparian resources, water quality, and fisheries (USDI-BLM 2005b).

Timber and Logging

Loggers typically have a strong sense of occupational identity that is tied to their lifestyle and the natural environment that they work in and believe they understand well. The loss of a job for a logger typically involves a change in a valued way of life, as well as the loss of a paycheck. Reductions in timber harvest on area national forests have generated considerable controversy between loggers, mill workers, and timber industry representatives on the one hand and other groups who argue that forests have other economic values, such as recreation and amenity values.

Timber employment is concentrated in only a few areas in the eight-county study area and lands managed by the Butte FO account for a very small portion of total harvest in this area. Timber related issue, raised during public scoping for this plan, included concerns regarding noxious weeks, fuel hazard reduction, and deal tree salvage.

Recreationists

The recreation opportunities available in the eight-county study area play an important role in the quality of life of many local residents, as well as attracting visitors from elsewhere in the state and further afield. Many people have moved to the area or choose to stay in the area because of these recreation opportunities. Popular recreation activities in the PA include big game hunting; upland bird and waterfowl hunting; fishing; mountain and road biking; camping, backpacking, and horsepacking; river rafting, canoeing and kayaking; swimming; lake boating; downhill skiing and snowmobiling, OHV use; picnicking; archery; gathering organic materials; organized festivals; and viewing wildlife and landscapes.

These activities involve diverse groups of people and changes in recreation management can affect people who engage in particular recreation activities very differently. Recreationists tend to organize into interest groups. The Capital Trail Vehicle Association, which is primarily concerned with OHV use, accounted for approximately 58 percent of the comments received during the public scoping process for the Butte RMP (319 of 554 comments). As a result, the majority of the comments received on recreation were primarily concerned with OHV use. Concerns were expressed that demand for motorized recreational access has increased in recent years, while motorized access has decreased, largely as a result of federal land management action and policies that favor non-motorized users. Some commenting felt that public lands should be available to all users, both motorized and non-motorized, but some areas and trails should have limited types of use (hiking use only or OHV use only) where different types of use tend to be incompatible.

Others felt that non-motorized uses are presently favored over motorized uses and felt that this balance should be changed, with motorized users allowed equal access (USDI-BLM 2005b).

Permitted Outfitters and Guides

The Butte FO authorized 19 Special Recreation Use Permits in Fiscal Year (FY) 2003. The primary activity for 13 of the Special Recreation Permits is big game hunting, with most big game hunting outfitter/guides pursuing bear in the fall and mountain lion in the winter. Special Recreation Use Permits are also issued for rock climbing in the Humbug Spires SRMA, with restrictions

that typically limit the activity to weekdays, so the general public can enjoy the resource on weekends without over-crowding (Rixford 2004). The Pipestone area is available for organized motorized vehicle events which require a permit (Rixford 2004). One person commenting during scoping requested that outfitters be able to take camping/river trips along the Big Hole River.

Individuals and Groups who give a High Priority to Resource Protection

A number of individuals and groups commenting during scoping for the Butte RMP expressed concern about resource protection issues, with particular emphasis placed on wildlife, fisheries, water issues, and special area designations. Comments included requests that habitat corridors for threatened, endangered, and sensitive species and the integrity and un-motorized character of all roadless areas be maintained. One person commenting recommended that the BLM identify impaired streams and implement restoration measures to support native fisheries. Water-related concerns included maintenance of hydrological and aquatic species goals, restoration of watershed health, and protection of riparian and wetland habitat and aquatic species. Many respondents identified areas for designation as special use areas. Areas identified included areas of critical environmental concern, wild and scenic river areas, recreational river areas, and wilderness study areas (USDI-BLM 2005b).

Individuals and Groups who give a High Priority to Resource Use

A number of individuals and groups expressed concern about limitations being placed on the availability of public lands for commercial uses such as livestock grazing, mineral development, and timber harvest. These people believe that local communities depend on these industries, which are a primary source of high paying jobs to local economies. Comments received during scoping for this project requested that the RMP revision focus on beneficial economic and social use of public lands, not locking them up from development or public access. Some commenting indicated that they support protection of water, aquatic species, and wildlife, but not to the point that it resulted in detrimental effects to the local economy, lifestyle, access to public lands, and the development of public lands (USDI-BLM 2005b).

Economic Conditions

Employment and Income

There were a total of approximately 135,200 full- and part-time jobs in the eight-county study area in 2000 (**Table 3-34**).

Table 3-34
Study Area Employment by Sector, 1990 and 2000

	Total Employment		Share of Total (Percent)		1990-2000	
	1990	2000	1990	2000	Absolute Change	Percent Change
Total full-time and part-time employment[1]	98,044	135,231	100	100	37,187	38
By Type						
Wage and salary employment	75,511	102,817	77	76	27,306	36
Proprietors employment	22,533	32,414	23	24	9,881	44
By Industry[2]						
Farm employment	3,755	4,204	4	3	449	12
Nonfarm employment	94,289	131,027	96	97	36,738	39
Ag. services, forestry, fishing and other	981	2,103	1	2	1,122	114
Mining	978	1,097	1	1	119	12
Construction	3,607	9,520	4	7	5,913	164
Manufacturing	4,565	6,402	5	5	1,837	40
Transportation and public utilities	4,579	5,303	5	4	724	16
Wholesale trade	2,881	3,925	3	3	1,044	36
Retail trade	18,206	26,399	19	20	8,193	45
Finance, insurance, and real estate	6,604	9,365	7	7	2,761	42
Services	28,083	42,115	29	31	14,032	50
Government and government enterprises	22,172	24,404	23	18	2,232	10
Federal, civilian	2,857	2,831	3	2	-26	-1
Military	1,400	1,125	1	1	-275	-20
State and local	17,915	20,448	18	15	2,533	14

[1] These figures, which are annual averages, include self-employed individuals, and full- and part-time jobs, with each job that a person holds counted at full weight.

[2] Totals by industry sector do not sum to the nonfarm employment total because actual numbers of jobs are not disclosed in some sectors in some counties to avoid disclosure of confidential information. Estimates for these items are, however, included in the totals. Source: U.S. Bureau of Economic Analysis, 2003b

The number of jobs increased by approximately 38 percent in the 1990s, with the largest increases occurring in the services, retail trade, and construction sectors. Employment increased in all sectors with the exception of the federal government sector, which experienced net job loss (**Table 3-34**). Employment increased in all eight counties over this period, with the largest increase (61 percent) occurring in Gallatin County. Gallatin County had the largest number of jobs in 2000 (51,661), followed by Lewis and Clark (38,839) and Silver Bow (18,988) counties (U.S. Bureau of Economic Analysis 2003b).

Annual average unemployment rates in the study area in 2003 ranged from 2.8 percent in Gallatin County to 6.5 percent in Deer Lodge County compared to a statewide average of 4.7 percent. Unemployment rates also exceeded the state annual average in Silver Bow (5.1 percent) and Broadwater (4.9 percent) counties (Montana Department of Labor and Industry 2004a).

BLM Contributions to Area Economic Activity

Butte Field Office operations and management make a direct contribution to area economic activity by employing people who reside in the area and by expending operations dollars. Management of BLM administered public lands and minerals is provided by a professional and administrative staff of about 60 permanent and other than permanent employees who are located in Butte. BLM expenditures in FY 2007 were about $3.6 million for labor and $4.3 million for operations (BLM, MIS, 2008). The response coefficients shown in **Table 3-35** indicate how total local employment and total local labor income respond to a $1000 change in local BLM expenditures.

Table 3-35
Response Coefficients Associated with BLM Employment and Non-salary Expenditures

Economic Sector	Units	Total Employment (jobs/M units)	Total Labor Income ($/M units)
BLM salaries	$	0.04	1,220
BLM Non-salary Expenditure	$	0.01	330

Source: IMPLAN, 2007

Potentially Affected Industries

The following paragraphs provide an overview of the industries that could be affected by the draft RMP: forest products, recreation and tourism, agriculture, and mining.

The land managed by the Butte FO, approximately 311,000 acres, is distributed across eight large counties, and comprises just 2.6 percent of the total land area in these counties. As a result, the contribution of activities on Butte FO land to the economies of these counties is relatively small. This contribution may, however, be very important at the community level and especially for individuals who make all or part of their living from activities on or related to this land.

Total BLM management and land uses on BLM lands contribute less than one percent to employment and labor income in the local economy.

Table 3-36 displays the BLM-related contributions to the local economy by industry.

Table 3-36
Current Role of BLM-Related Contributions to the Area Economy

Industry	Employment (jobs)		Labor Income (Thousands of 2007 dollars)	
	Area Totals	BLM-Related	Area Totals	BLM-Related
Agriculture	4,441	78	$89,671.1	$1,795
Mining	1,487	23	$132,836.1	$1,496
Utilities	853	3	$84,585.0	$291
Construction	15,285	6	$583,224.8	$212
Manufacturing	5,704	39	$230,657.7	$1,177
Wholesale Trade	3,428	41	$151,399.2	$1,784
Transportation & Warehousing	3,717	26	$146,698.4	$965
Retail Trade	19,665	140	$486,642.8	$3,234
Information	2,416	6	$129,140.8	$283
Finance & Insurance	6,029	16	$244,346.8	$628
Real Estate & Rental & Leasing	7,287	19	$238,873.3	$592
Prof, Scientific, & Tech Services	11,396	22	$485,902.7	$785
Management of Companies	734	5	$23,004.5	$141
Admin, Waste Management & Rem. Svc.	4,968	14	$102,256.1	$297

Table 3-36
Current Role of BLM-Related Contributions to the Area Economy

Industry	Employment (jobs)		Labor Income (Thousands of 2007 dollars)	
	Area Totals	BLM-Related	Area Totals	BLM-Related
Educational Services	1,989	7	$33,454.6	$114
Health Care & Social Assistance	13,923	45	$519,350.4	$1,755
Arts, Entertainment, and Rec	4,530	59	$62,651.3	$977
Accommodation & Food Services	14,053	345	$211,445.5	$5,171
Other Services	9,196	41	$171,101.1	$696
Government	25,311	259	$1,433,467.6	$11,506
Total	**156,415**	**1,193**	**5,560,710**	**33,898**
BLM as Percent of Total	---	**0.76%**	---	**0.61%**

Source: IMPLAN/FEAST, 2007

Table 3-37 displays the employment and labor income by major BLM program area.

Table 3-37
Local Employment and Income by BLM Program Area

BLM Program Area	Total Number of Jobs Contributed	Labor Income ($1,000)
Recreation	510	$13,073.6
Wildlife and Fish	292	$7,549.9
Grazing	11	$197.9
Timber	106	$2,999.9
Minerals	32	$1,290.6
Ecosystem Restoration	10	$335.6
Payments to States/Counties	144	$5,563.3
BLM Expenditures	89	$2,887.8
Total BLM Management	1,193	$33,898.5

Source: IMPLAN/FEAST, 2007

Forest Products

Lumber and wood products accounted for approximately 1.7 percent of total covered employment in Montana in 2001. Lumber and wood products employment in the six study area counties where data are available ranged from 0.1 percent of total covered employment in Silver Bow County to 1.2 percent in Jefferson County (Montana Department of Labor and Industry 2004). Although data were withheld for Broadwater County, wood products play an important role in the county economy, employing 260 people in 2000, approximately 12 percent of total full- and part-time employment (Broadwater County Planning Department 2003).

Data compiled by the University of Montana's Bureau of Business and Economic Research (BBER), indicate that there were a total of 44 forest products facilities in the eight study area counties in 1998.
These facilities included lumber mills, log home and log furniture manufacturers, and post and pole facilities, with log home facilities and lumber mills accounting for 36 percent and 32 percent of the total, respectively (BBER 2001).

Eighteen of these facilities were located in Gallatin County. Jefferson and Park counties accounted for six facilities each. Beaverhead and Lewis and Clark counties each accounted for five facilities. Two facilities were located in Broadwater County.

Annual harvest data, available at 5 year intervals, indicate that total timber harvest in the eight-county study area has decreased from a high of 113 million board feet (MMBF) in 1976 to just 61 MMBF in 1998. Much of this decline is a result of reductions in timber harvest on area national forests. Lewis and Clark County accounted for nearly half of the total harvest in the eight-county area in 1998 (BBER 2001).
Harvest from land managed by the Butte FO has fluctuated from year-to-year over the past two decades, at times quite dramatically. Harvest levels ranged from 33 thousand board feet (MBF) in 1995 to 1,683 MBF in 2001 (USDI-BLM 2004h).

Harvest from land managed by the Butte FO comprised less than 1 percent of total harvest from the eight-county area in 1987, 1992, and 1998, the years that total harvest data are available.

The relationship between harvest from BLM lands and the local economy is complicated by the fact that in 1998 eight counties, none of them in the study area, received more than 80 percent of all timber harvested in Montana. More than half of the total timber harvested in Lewis and Clark County in 1998 was, for example, processed outside the eight-county study area (BBER 2001). While the forest products sector accounts for a relatively small share of local employment, this employment is, of course, very important for the individu-

als involved. Employment in the forest products sector is relatively well paid. The average annual salary for the lumber and wood products sector in Montana was $32,797 in 2001, compared to an average annual state salary of $25,194 (Montana Department of Labor and Industry 2004b). Employment in the forestry and logging sector is, however, often seasonal or part-time and workers are often self-employed.

The response coefficients shown in **Table 3-38** indicate how total employment and total labor income respond to a MMCF change in local production for the economic sectors associated with timber management.

Table 3-38
Response Coefficients Associated with Timber Management

Economic Sector	Units	Total Employment (jobs/MMCF)	Total Labor Income (M$/MMCF)
Logging	CF	55	1,460
Sawmills	CF	51	1,610
Total	**CF**	**106**	**3,070**

Source: IMPLAN, 2007

Recreation and Tourism

Nonresident visits to Montana increased by approximately 27 percent or 2 million during the 1990s, increasing from about 7.5 million in 1991 to 9.5 million in 2001, with an estimated 9.7 million nonresident visits to the state in 2003 (The University of Montana, Institute for Tourism and Recreation Research [ITRR], 2002; 2004). Visitation data are not compiled at the county level, but it seems reasonable to assume that visitation to the eight counties also increased over this period.

Recreation and tourism is not classified or measured as a standard industrial category and therefore, employment and income data are not specifically collected for this sector. Components of recreation and tourism activities are instead captured in other industrial sectors, primarily the retail sales and services sectors. The contribution of travel and tourism to a local economy may, however, be estimated by assigning all or a portion of employment in other sectors to visitors. Using ratios developed for Missoula County (Ellard et al. 1999), travel-related, covered employment ranges from approximately 3.2 percent of total covered employment in Jefferson County to approximately 14.3 percent in Park County, compared to a statewide average of 7.2 percent (**Table 3-39**).

Employment in the recreation and tourism sector tends to be seasonal and relatively low paid, with a high proportion of the labor force self-employed. The travel related employment estimates presented in **Table 3-39**

Table 3-39
Travel Related Employment, 2001

	Estimated Travel-Related Employment	% of Total Employment
Beaverhead	329	9.9
Broadwater*	55	4.9
Deer Lodge	298	9.5
Gallatin	3,422	9.8
Jefferson*	69	3.2
Lewis & Clark*	1,550	5.4
Park	747	14.3
Silver Bow*	1,117	8.1
Montana	27,706	7.2

* RMP-related effects are most likely to occur in these counties, where the majority of the PA lands are located.

1. Travel-related estimates and total employment data are based on ES-202 data compiled by the Montana Department of Labor and Industry. These data are a count of workers on the payrolls of business, nonprofit, and government establishments who are subject to Montana's unemployment insurance laws. Self-employed workers are included in these totals on a voluntary basis only. These data result in lower employment totals than the full- and part-time estimates developed by the U.S. Bureau of Economic Analysis.

2. Travel-related employment estimates were developed by assigning a portion of total employment in travel-related sectors to nonresidents using ratios from Ellard et al. (1999). Ellard et al.'s ratios were developed specifically for Missoula County based on national ratios and local business data. The application of these ratios to the eight study counties and the resulting estimates presented here should, as a result, be treated with caution and are provided only to give a general indication of the relative importance of travel-related employment to the eight area counties.

Sources: Ellard et al. 1999; Montana Department of Labor and Industry 2004b.

are based on shares of four SIC sectors: auto dealers and service stations, eating and drinking, hotels and lodging, and amusement and recreation services. The annual average salaries in these sectors in 2001 were $22,833, $9,399, $12,931, and $12,254, respectively, compared to an average annual state salary of $25,194 (Montana Department of Labor and Industry 2004b).

The general estimates presented in **Table 3-39** provide some indication of the relative importance of travel-related employment by county, but it is important to note that not all of this employment is directly attributable to recreation use on land in the Butte PA. There are a number of other important recreation areas and attractions located within or in close proximity to the eight counties. Most of the travel-related employment in Park County, for example, where land managed by the Butte FO comprises just 0.4 percent of the county land area, is likely related to the county's proximity to Yellowstone National Park.

The response coefficients shown in **Table 3-40** estimate how total employment and total labor income respond to changes in recreation use for the economic sectors associated with recreation use.

Agriculture

The Census of Agriculture indicated that the eight-county study area had 2,801 farms and ranches in 1997, with nearly 60 percent of these engaged in cattle production. Beaverhead County is Montana's largest cattle producer and accounted for approximately 40 percent of total cattle production in the eight-county area in 1997. Sheep and lambs are also produced in the area with about 416,000 head and 1,981 farms. Farmland comprised approximately 38 percent of the total eight-county area, compared to 63 percent statewide. The percent of farmland by county ranged from 22 percent of Deer Lodge and Silver Bow counties to 59 percent of Broadwater County (**Table 3-41**).

The overall market value of agricultural products sold in the eight-county area in 1997 was about $190 million, with crops and livestock accounting for 37 percent and 63 percent of this total, respectively. Cattle and calves were the main livestock produced in the area, accounting for 53 percent of all agricultural products sold by value. Cattle and calves ranged from 31 percent of agricultural products sold by value in Broadwater County to 89 percent in Silver Bow County.

Farms in the eight-county area provided about 4,000 jobs in 2001, approximately 3 percent of total employment, compared to 5 percent statewide. Agricultural employment was relatively more important in Broadwater and Beaverhead counties, accounting for approximately 15 percent and 13 percent of total full- and part-time employment in 2001, respectively. Agricultural employment accounted for less than 5 percent of total employment in four of the remaining six counties: Sil-

Table 3-40
Response Coefficients Associated with Recreation Use

Type of Recreation Use	Units	Total Employment (jobs/M units)	Total Labor Income ($/M units)
Day Use	Visits	0.32	8,500
Non-local Overnight	Visits	1.57	38,400
Local Overnight	Visits	0.86	23,700

Source: Averaged from response coefficients from IMPLAN, 2007

Table 3-41
Number of Farms and Average Farm Size by County, 1997

	Number of Farms	Land in Farms (acres)	% of Total County Area	Average Farm Size (acres)
Beaverhead	360	1,152,008	32	3,200
Broadwater*	219	452,744	59	2,067
Deer Lodge	83	101,657	22	1,225
Gallatin	835	759,944	46	910
Jefferson*	266	364,153	34	1,369
Lewis and Clark*	502	822,066	37	1,638
Park	420	749,103	42	1,784
Silver Bow*	116	100,181	22	864
Study Area Total	2,801	4,501,856	38	1,607
Montana	24,279	58,607,778	63	2,414

*RMP-related effects are most likely to occur in these counties, where the majority of the PA lands are located.
Source: U.S. Department of Agriculture, 1999

ver Bow (1 percent), Gallatin (2 percent), Lewis and Clark (2 percent), and Deer Lodge (3 percent). Employment in the agricultural sector is often seasonal or part-time and workers are often self-employed.

Grazing fees and BLM allotments are measured in terms of animal unit months (AUMs). For a cattle operation, an animal unit (AU) is defined as one cow with a nursing calf or its equivalent. An AUM is the amount of forage needed to sustain that cow and calf for one month. AUMs are authorized by the BLM on an annual basis. Data from the Butte FO indicate that the total number of cattle grazing in the eight county study area has fluctuated over the last decade, ranging from approximately 219,000 in 1996 to about 188,000 in 2003 and falling below 200,000 for the first time in 2002 (USDI-BLM 2004c). Total AUMs in the eight county study area and AUMs authorized by the Butte FO vary from year-to-year.

Total AUMs over the last decade ranged from 2.25 million in 2003 to 2.63 million in 1996. Grazing on Butte FO-managed land in the eight-county area currently involves 185 livestock operators grazing on 385 separate allotments.

In Fiscal Year 2005, livestock grazing on BLM lands involved livestock operators who had 101 Section 3 grazing permits (i.e. grazing on public lands within grazing districts, BLM Manual 1373.12 (USDI-BLM 1980b)) and 84 Section 15 grazing leases (grazing on public lands outside of grazing districts). Fifty percent of revenues from Section 15 grazing fees on public domain lands are distributed to the state and counties; 12.5 percent of grazing fees from Section 3 leases are distributed to the state and counties. The combined total (Section 3 and Section 15) number of active AUMs in FY05 was 23,585 AUMs.

Of the estimated 2,250,000 AUMs in the eight-county area in 2003, with approximately 13,600 or 0.6 percent of the total are provided by land managed by the Butte FO (**Table 3-42**).

AUMs on land managed by the Butte FO ranged from 0.02 percent of total AUMs in Broadwater County to 2.7 percent of the total in Jefferson County. The majority of the AUMs in the PA are located in Broadwater (30 percent), Jefferson (30 percent), and Lewis and Clark (12 percent) counties.

Although BLM forage comprises a relatively small share of total AUMs in the study area, this forage may be particularly valuable to livestock producers because grazing fees ($1.35/AUM in FY2008) are considerably lower than the statewide average of $16 per AUM (USDI, BLM, 2004i). Access to BLM and Forest Service grazing may be important to area livestock producers even though additional management costs are usually incurred to use these lands. The difference between the statewide average grazing fee ($16/AUM) and the BLM fee ($1.35/AUM) represents a consumer surplus to the permittee of up to $14.65 per AUM. The total consumer surplus associated with 25,677 AUMs is up to $376,000.

The response coefficients shown in **Table 3-43** indicate how total employment and total labor income respond to changes in levels of livestock grazing.

Table 3-43
Response Coefficients Associated with Grazing Management

Class of Livestock	Units	Total Employment (jobs/M units)	Total Labor Income ($/M units)
Cattle and Horses	HMs	0.34	6,090
Sheep and Goats	HMs	0.14	1,190

Source: IMPLAN, 2007

Table 3-42
Animal Unit Months by County, 2003

County	Total Cattle	Total AUMs	BLM AUMs[1]	BLM % of Total AUMs
Beaverhead	81,000	972,000	426	0.044
Broadwater*	12,700	152,400	4,151	0.027
Deer Lodge	5,700	68,400	483	0.71
Gallatin	22,900	274,800	1,013	0.37
Jefferson*	12,600	151,200	4,058	2.68
Lewis and Clark*	21,800	261,600	1,689	0.65
Park	25,300	303,600	723	0.24
Silver Bow*	5,500	66,000	1,119	1.70
Total	**187,500**	**2,250,000**	**13,662**	**0.61**

*RMP-related effects are most likely to occur in these counties, where the majority of the PA lands are located.
AUMs – Animal Unit Months [1] BLM AUMS in this context refers to those AUMs within the Butte Field Office PA.
Source: USDI-BLM 2004c.

Mining

Although mining has played a very significant role in the past in the PA, mining employment decreased as a share of total covered employment during the 1990s in all study area counties where data are available. In 2001, the mining sector accounted for less than one percent of total covered employment in four of the eight study area counties, compared to 1.4 percent statewide.

Mining employment did, however, account for approximately 14 percent of total covered employment in Jefferson County and 3.5 percent in Broadwater County (**Table 3-44**).

Table 3-44
Mining Employment by County, 2001

	Mining	% of Total Employment
Beaverhead	(D)	(D)
Broadwater*	40	3.5
Deer Lodge	26	0.8
Gallatin	63	0.2
Jefferson*	303	14.0
Lewis and Clark*	20	0.1
Park	5	0.1
Silver Bow*	145	1.1
Montana	5,542	1.4

*RMP-related effects are most likely to occur in these counties, where the majority of the PA lands are located.

(D) – Disclosure suppression.

Source: Montana Department of Labor and Industry, 2004b.

The mining sector is typically well paid. The average annual salary for the mining sector in Montana was $51,787 in 2001, compared to an average annual state salary of $25,194. Average annual salaries by mining subsector ranged from $41,000 for the mining and quarrying of nonmetallic minerals to $57,486 for metal mining (Montana Department of Labor and Industry 2004b).

The response coefficients shown in **Table 3-45** indicate how total employment and total labor income respond to changes in mineral production for various commodities.

Environmental Justice

Environmental justice refers to the fair treatment and meaningful involvement of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, programs, and policies. It focuses on the consideration of environmental hazards and human health to avoid disproportionately high and adverse human health or environmental effects on minority and/or low-income populations. Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other non-white persons are defined as minority populations by the Interagency Working Group convened under the auspices of the Executive Order. Low-income populations are defined as persons living below the poverty level based on total income of $19,971 for a family household of four based on the 2000 census.

None of the defined minority populations represent more than 3 percent of the population in the PA, based on 2000 census numbers. There are no Indian Reservations located in or in close proximity to the PA.

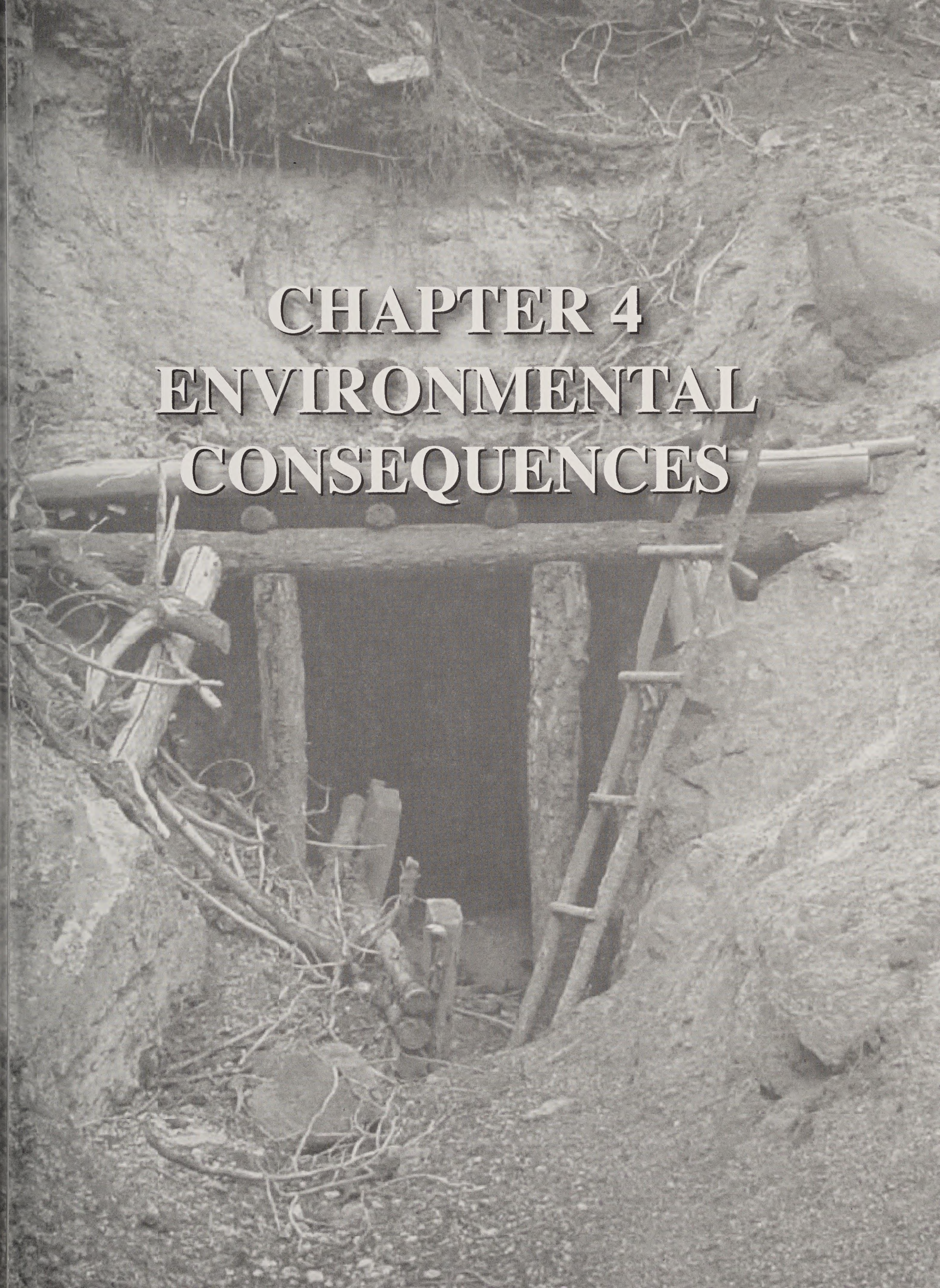
Members of the Confederated Salish-Kootenai Tribes of the Flathead Reservation are known to use resources on public lands in the PA for cultural (and to a lesser extent subsistence) purposes. The Flathead Reservation had a 2000 American Indian population of 6,999.

In 1999, 14.6 percent of the persons living in the state of Montana had incomes below the poverty level. In the PA, the percent of persons living below the poverty level ranges from 9 percent in Silver Bow County to 17.1 percent in Beaverhead County. The average per capita income was $17,151 for the State of Montana. In the PA, this compares to a low of $15,580 in Deer Lodge County and a high of $19,074 in Gallatin County.

Table 3-45
Response Coefficients Associated with Mineral Production

Mineral Commodity	Units	Total Employment (jobs/M units)	Total Labor Income ($/M units)
Oil and Gas Extraction (Natural Gas)	M Cubic Feet	0.03	2,260
Stone Mining and Quarrying (Crushed Stone Common variety)	Short Tons	0.05	2,060
Stone Mining and Quarrying (Crushed Stone High Purity)	Short Tons	0.05	2,100
Dimension Stone	Short Tons	2.56	103,570
Construction Sand and Gravel	Short Tons	0.05	2,120

Source: IMPLAN, 2007



CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

HOW TO READ THIS CHAPTER

Chapter 4 presents the likely impacts on the human and natural environment in terms of environmental, social, and economic consequences predicted to occur from implementing the alternatives presented in Chapter 2. Chapter 2 also provides a summary comparison of the impacts in table format (see **Table 2-24**).

This chapter is divided into two main parts. The first part describes environmental consequences associated with proposed management in RMP alternatives for the Butte Field Office overall. The second part entitled "Environmental Consequences of Five Site-Specific Travel Plans" describes the effects of the site-specific travel plan alternatives (implementation decisions) for the Helena, East Helena, Lewis and Clark County NW, Boulder/Jefferson City, and Upper Big Hole River Travel Planning Areas. This portion of the chapter includes discussion of cumulative effects at the scale of each travel planning area as well as at the Decision/Planning Area scales.

The first part of this chapter describes the effects of the proposed management actions by RMP alternative on the resources, resource uses, special designations, and social and economic concerns present in the Butte Field Office Decision Area. Each section includes the following items:

- Effects Common to All Alternatives – this section describes impacts that are the same across all of the alternatives. This information is presented here to avoid repetition. Management actions that would not cause impacts are identified here and are not discussed further. Resources, resource uses, and programs that only have impacts that are common to all alternatives are only discussed in this section and are not discussed further.
- Effects of Alternative A
- Effects Common to Action Alternatives – this section provides analysis of similarities between Alternatives B, C, and D where they occur. Some resources do not have this section. **It is important to remember that these effects apply to Alternatives B, C, and D and are not restated in the individual alternative discussions.**
- Effects of Alternative B
- Effects of Alternative C
- Effects of Alternative D

Following the direct and indirect effects analysis, the following analysis appears:

- Cumulative Impacts
- Irretrievable or Irreversible Commitment of Resources; and
- Unavoidable Adverse Impacts

The *Introduction* section includes definitions of the types of effects that will be projected throughout the impact sections and the terminology used, discusses the availability of data, and identifies the BLM's Critical Elements. This section is followed by the analysis assumptions and detailed description of impacts. Since mitigation measures and standard operating procedures have been included in the alternatives as design features, many potential impacts are reduced or eliminated. The section titled *Effects Common to All Alternatives* describes impacts that will not vary by alternative because management actions are the same in all the alternatives. These impacts are not discussed again. Additionally, for any given resource, some management actions will not affect the resource. If a management action is not discussed it is because the resource analyst determined there would be no impact.

Separate sections describing cumulative impacts, irretrievable and/or irreversible commitment of resources, and unavoidable adverse impacts are presented at the end of the chapter.

For ease of reading, analysis shown in Alternative A (or any other alternative) may be referenced in discussions of subsequent alternatives with such statements as "impacts would be the same as Alternative A" or "impacts would be the same as Alternative A, except for . . ." as applicable.

INTRODUCTION

The analysis of effects associated with the alternatives is required by BLM planning regulations and by the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA). The analysis presents best estimates of impacts. As required by NEPA, direct, indirect, and cumulative effects are discussed. When quantitative information is available, impacts have been calculated primarily through Geographic Information System (GIS) applications. This entailed using Arc Info or Arc GIS software to overlay and/or query various geographically mapped layers of resource information to generate or calculate data for various analyses. All quantitative information is approximate and could be subject to further refinement when considered at finer scales.

Because the alternatives describe an overall management framework, and not site specific locations for activities (generally), the environmental consequences are most often expressed in comparative, general terms. Impacts are quantified to the extent practical with available data.

In the absence of quantitative data, best professional judgment provides the basis for the impact analysis.

Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources and the Planning Area, information provided by experts in the BLM or in other agencies, and information contained in pertinent existing literature. The baseline used for the impact analysis is the current condition or situation as described in Chapter 3 (Affected Environment).

Each resource analyst developed analysis assumptions to help guide the determination of effects, which are described in the beginning of each resource section.

TYPES OF EFFECTS

Direct, indirect, and cumulative impacts are considered in this effects analysis, consistent with direction provided in 40 CFR 1502.16.

Direct impacts are caused by an action or implementation of an alternative and occur at the same time and place. Indirect impacts result from implementation of an action or alternative, but are usually later in time or removed in distance, and are reasonably certain to occur. Cumulative impacts result from activities combined with past, present, and future actions on all jurisdictions. Cumulative impacts also result from individually minor but collectively significant actions over time. Past and present impacts are reflected in the existing conditions.

Actions anticipated over the next 20 years on all lands in the Planning Area, including private, state (MFWP and DNRC) and federal (USFS, BOR, NPS, USFWS) ownerships, have been considered in the analysis to the extent reasonable and possible. This analysis is provided for each resource and program area and is general because decisions about other actions in the Planning Area would be made by many public and private entities, and the location, timing, and magnitude of these actions are not well known.

ANALYSIS TERMINOLOGY FOR BUTTE RMP

The following list of definitions is used in the analysis of alternatives.

Irretrievable Commitment of Resources: result from actions in which resources are considered permanently lost.

Irreversible Commitment of Resources: result from actions in which resources are considered permanently changed.

Negligible: an effect at the lower level of detection; there would be no measurable change. Effects may not be readily noticeable.

Low or Minor: an effect is slight but detectable; there would be a small change.

Medium or Moderate: an effect is readily apparent; there would be a measurable change.

High or Major: an effect is severe; there would be a highly noticeable/ measurable change.

Unavoidable Adverse Effects: those that remain following the implementation of mitigation measures, and include effects for which there are no mitigation measures.

Beneficial or Positive: an effect promoting a favorable result for a specific resource or resource use. Could be used in short-term, long-term, or both short and long-term contexts.

Adverse or Negative: an effect that is detrimental or causes harm to a specific resource or resource use. Could be used in short-term, mid-term, long-term, or all three contexts.

Neutral: an effect that is neither beneficial nor adverse to a specific resource or resource use.

SCOPE OF THE ANALYSIS

The impacts disclosed are limited to the temporal and geographic scope described below unless otherwise defined in the individual resource sections.

Temporal Scope

- Short-term: effects lasting less than 5 years
- Mid-term: effects lasting 5-10 years
- Long-term: effects lasting more than 10 years

Geographic Scope

- Decision Area – refers to lands in the planning where the BLM has authority to make land use and management decisions. This includes split estate lands where the federal government has retained subsurface minerals.
- Analysis Area – lands within the area to be analyzed. The analysis area is the decision area unless otherwise defined in the individual resource section.
- Planning Area – all land within the Butte Field Office administrative boundary regardless of ownership or jurisdiction.

AVAILABLE DATA AND INCOMPLETE INFORMATION

The best available information pertinent to the decisions to be made was used in development of the RMP. Considerable effort was put forth to acquire and convert resource data into digital format for use in the plan—both from BLM sources and from outside sources such

as the Montana Natural Heritage Program. Certain information was unavailable for use, usually because inventories have either not been conducted, were not complete, or were not of consistent quality across the Planning Area. Some of the major areas where data are incomplete or substantially lacking are:

- Planning Area-wide vegetation by species
- Fire Regime Condition Classes determination and documentation for all vegetation types in the Decision Area
- Detailed soil survey for lands in Beaverhead County
- Certain wildlife inventory data (i.e. lynx denning habitat, occupied pygmy rabbit habitat)
- Wildlife monitoring data
- 100-year floodplain mapping
- Recreation monitoring data
- Route safety data

As a result, impacts cannot be quantified given the proposed management of certain resources. Where this occurs, impacts are projected in qualitative terms, or in some instances, are described as unknown. Subsequent project level analysis will provide the opportunity to collect and examine site-specific inventory data necessary to determine the appropriate application of the RMP level guidance. In addition, ongoing inventory efforts within the Planning Area continue to update and refine the information used to implement this plan.

CRITICAL ELEMENTS

BLM considers 14 items as "Critical Elements of the Human Environment" that must be addressed during environmental analysis.

Currently no Wild and Scenic Rivers (WSRs) are designated in the Planning Area and thus there are no existing WSRs to address. Impacts related to proposed designations or findings are described under each respective Wild and Scenic Rivers section by alternative.

Floodplains and Prime/Unique Farmlands are generally not present on BLM-administered lands covered by this plan. Where they may occur, subsequent project level analysis for any projects with potential to impact Floodplains or Prime/Unique Farmlands would be prepared to address potential impacts.

The remaining 11 critical elements are addressed under pertinent sections of Chapter 4. These include: Air Quality, Areas of Critical Environmental Concern, Cultural Resources (addressed under Cultural Resources and Tribal Treaty Rights), Environmental Justice, Native American Religious Concerns (addressed under Cultural Resources and Tribal Treaty Rights), Threatened or Endangered Species (addressed under Special Status Species), Hazardous or Solid Wastes, Water Quality, Wetlands/Riparian Zones (addressed under Vegetation – Riparian and Wetlands), Wilderness, and Noxious Weeds and Non-Native Invasive Plants (addressed under Vegetation—Invasive Species including Noxious Weeds).

ANALYSIS ASSUMPTIONS AND GUIDELINES

A number of assumptions were made to facilitate the analysis of the alternative management actions. These assumptions set guidelines and provide reasonably foreseeable levels of development that would occur within the Planning Area over the analysis period (20 years). These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative and described in Chapter 2. If a resource heading does not appear in the following sections, it is because no assumptions were made.

General Assumptions

- Sufficient funding and personnel would be available for implementation of any alternative.
- Implementation of all alternatives would be in compliance with all valid existing rights, federal regulations, bureau policies, and other requirements.
- Local climate patterns of historic record and related conditions for plant growth would continue during the analysis period.
- Appropriate maintenance would maintain the functional capability of all developments.
- The discussion of impacts is based on the best available data. Knowledge of the Planning Area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to infer environmental impacts where data is limited.
- Acreages and other numbers used in the analysis are approximate projections for comparison and analytical purposes only. Readers should not infer that they reflect exact measurements or precise calculations.
- Adjustments made to the Preferred Alternative for travel management between the Draft RMP/EIS and the Proposed RMP/Final EIS were assessed to be so minor as to not cause any marked changes in analyses or conclusions based on road management. Therefore, while actual road mileage changes are reflected where pertinent in the Proposed RMP/Final EIS, road-based analyses (such as road density calculations, road-based moving windows analyses, and economic analyses) were not re-done since the Draft RMP/EIS.

RESOURCE ASSUMPTIONS

Air Quality

- Demand for clean air in the Planning Area is expected to remain constant.
- Increasing uses of the area for recreational and aesthetic reasons may lend importance to maintaining the current quality of the air, especially during seasons of high visitation.
- Vegetative treatment designed to reduce wildland fuels, including prescribed burning, would reduce wildland fire severity.

Soil Resources

- Soil erosion would be mitigated through the use of best management practices and Land Health Standards described in **Appendix F**.
- This analysis assumes that any reduction in grazing preference by the BLM would cause a proportional reduction in actual use levels.
- BLM roads will continue to be maintained, with priority placed on those most heavily used by the public.
- State and major county roads will continue to be maintained to current levels and generally, county roads will not be abandoned. BLM facilities, mainly roads, will continue to be maintained, with priority placed on those most heavily used by the public.
- An increase in wildland fuel reduction activities in the analysis area will result in a decrease in fire severity.
- Natural process assumptions include: roads in the Butte Field Office will continue to erode from natural causes, increased vegetative cover would lead to reduced soil erosion, and removal of conifer encroachment could minimize accelerated soil erosion.

Water Resources

- Water quality requirements will be achieved through the use of best management practices, implementation of Land Health Standards described in **Appendix F**, and working with the MDEQ in the future development of water quality restoration plans.
- Water quality meets or is moving towards State of Montana water quality standards.
- Water quality restoration plans and the establishment of Total Maximum Daily Loads (TMDLs) will improve water quality.
- Vegetative treatment designed to reduce fuels, including prescribed burning, will reduce wildland fire severity.
- Management prescribed for rivers found suitable for designation in the National Wild and Scenic Rivers system will protect the outstandingly remarkable values, tentative classification, and free-flowing nature of those segments.
- BLM roads will continue to be maintained, with priority placed on those most heavily used by the public.
- Process assumptions include: roads in the Butte Field Office will continue to erode from natural causes resulting in potential impacts on water quality in adjacent streams, increased vegetative cover will lead to reduced soil erosion and in certain instances reduced deposition of sediments into streams.
- The discussions of impacts on water from the four alternatives are based on the best available data. Knowledge of the analysis area and professional judgment from observation and analysis of conditions and responses in similar areas are used to infer environmental impacts where data is limited.

Vegetative Communities

- Analysis of proposed vegetative treatments (except for noxious weeds unless otherwise stated) assumes that the high end of acreage treatment ranges would be implemented.
- Projections on how many decades may be necessary to reach certain vegetative conditions from proposed treatment rates are based on results from SIMPPLLE model runs.

Forest and Woodlands

- The need to manage forests and woodlands will increase to accommodate multiple uses associated with fish and wildlife habitat, water yield, livestock grazing, fire activities, forest product removal, and recreation.
- Treatments will be successful and promote the desired changes in ecological succession that will restore vigor, vegetation production, and overall forest health, especially for warm, dry forest types and woodlands.
- The RMP applies the approach that has been used in recent coordinated landscape analysis with the Forest Service to provide a range of ecological conditions needed to maintain a natural range of species that were found in the area prior to settlement.
- Historic conditions (i.e., more frequent and widespread wildland fires that burn at less intensity) provide a more stable and healthy set of conditions that local native plants are more adapted to.

Noxious Weeds

- Noxious weeds on public lands will be controlled with a variety of methods, but will not be eradicated.
- Noxious weeds and invasive species populations will increase as a result of ongoing natural and human-induced activities (e.g., livestock and wildlife foraging, roads, vegetation treatments, wildland fire and recreational activities).
- The need to control noxious weeds will increase as public knowledge about the adverse effects of noxious weeds increases, as new noxious weeds are introduced, and as existing weed populations expand.
- Infestations of noxious weeds decrease diversity and vigor of desirable and native plant communities.
- Increases in noxious weeds are dependent on conditions favorable for weed establishment (e.g., there are seed source(s), safe sites for seed germination, and insufficient competition from other species to inhibit seedling growth).
- Under the action alternatives, acreage estimates of weed spread by alternative assume a "worst case" scenario where the high end of proposed acreage ranges of vegetation treatments would occur, combined with implementation of the low end of proposed weed treatment acreage ranges by alternative.

Grasslands and Shrublands

- The need to manage rangelands will increase to accommodate multiple uses associated with fish and wildlife habitat, livestock grazing, recreation, riparian habitat, and water quality.
- Over-utilization of rangelands will increase the spread of noxious weeds and the potential for sediment to enter streams and adversely affect water quality and the aquatic biota.
- Rates of conifer encroachment into grasslands and shrublands were estimated based on current vegetation mapping compared to historic vegetation portrayed by SIMPPLLE model runs, and the assumption that conifer encroachment began 100 years ago.

Riparian and Wetlands

- Buffers of relatively intact vegetation in riparian and wetland areas will reduce impacts on water quality, channel morphology, and the aquatic biota.
- Beavers are a natural and desirable component of riparian and wetland habitats.
- In alternatives that call for Riparian Management Zones, management of RMZs with a primary focus on riparian values (such as mechanical treatments of vegetation that improve vegetative conditions while providing for down woody material and habitat complexity) will improve the ecological functional status of streams and associated riparian areas as wildlife habitat.
- Analysis assumes 80-foot site potential tree height.
- The functioning condition on approximately ⅓ of riparian areas is reduced due to factors sometimes outside the control of BLM's management, i.e. roads, upstream dams, etc.
- Analysis assumes treatment figures for Alternative A are a continuation of what has occurred.

Wildlife

- Vegetation treatments would be effective and produce the anticipated short-term and long-term results.
- Vegetation treatments would be implemented in the manner described in Chapter 2.
- Acreage indications of habitat improvement associated with vegetation treatments do not consider potential continuing loss of a particular habitat type due to continued fire suppression.
- The availability, quality, and amount of habitat correlates to the viability, health, and size of wildlife populations dependent on the habitat.
- There is a threshold level of disturbance or habitat degradation a species can sustain before the population viability is reduced.
- Management actions intended to benefit habitat for special status and/or priority species would benefit most other species occurring in the same vicinity.
- Demand for wildlife habitat is expected to increase given listings under the Endangered Species Act and increasing wildlife-based recreational activities in the Planning Area (wildlife viewing, hunting, etc.).
- Vegetative treatments would be expected to benefit wildlife habitat by moving vegetation towards a "range of natural variability." Although it is recognized that modifying vegetation could remove or lessen the quality of habitat for some species (i.e. removing conifer encroachment from sagebrush to increase breeding and foraging habitat for sagebrush obligate species would remove hiding habitat for elk), overall, it is assumed that vegetative treatments would have long-term benefits to wildlife habitats.
- The more acres within a No Surface Occupancy or No Lease oil and gas stipulation, the more overall protection a wildlife species would have from oil and gas development. When comparing alternatives, those alternatives with more acres in NSO or NL would provide the least negative effects to wildlife. As with NSO and NL stipulations, when comparing alternatives, the more acres an alternative has within

a timing restriction, the more wildlife species would be protected from disturbance during crucial seasons of use.

Fish

- Road decommissioning would be done properly with BMPs in place and sedimentation and other negative impacts from roads to the aquatic environment would diminish as the road becomes part of the natural landscape and topography.
- Water quality meets or is moving towards State of Montana water quality standards.
- Recreational demand, including fishing and other uses will continue to increase.
- Livestock type and stocking will remain relatively stable over the planning period.
- Management actions intended to benefit a specific habitat for special status species will likely influence other species within that same habitat. Given this, management of fisheries and other aquatic species habitat is not discrete, since actions that benefit one species, may provide adverse (or beneficial) effects on another.
- There is a direct correlation between the amount of quality habitat and fish populations and changes in habitat quality could cause an increase or decrease in fish numbers.
- The more acres within a No Surface Occupancy or No Lease oil and gas stipulation, the more overall protection a fish species would have from oil and gas development. When comparing alternatives, those alternatives with more acres in NSO or NL would provide the least negative effects to fish.

Special Status Species

- Conservation measures to improve and secure habitat would continue to receive special consideration during planning.
- There would be changes in listed and special status species in the future.

Wildlife

- Vegetation treatments would be effective and produce the anticipated short-term and long-term results.
- Vegetation treatments would be implemented in the manner described in Chapter 2.
- The availability, quality, and amount of habitat correlate to the viability, health, and size of wildlife populations dependent on the habitat.
- There is a threshold level of disturbance or habitat degradation a species can sustain before the population viability is reduced.
- The identification and delineations of habitat accurately represents the conditions on the ground; therefore, impacts to the delineated habitat areas would impact associated wildlife and wildlife habitat.

Fish

- Assumptions for special status fish are the same as those under the Fish section above.

Plants

- Harvest or collection of native plants and seeds for scientific study, medicinal, or commercial uses could increase, increasing the vulnerability of some rare species or populations.
- Noxious weed infestation and treatments will pose a risk to some special-status plants.

Wildland Fire Management

- The Forest Service and Montana DNRC will continue to assume fire suppression responsibilities on BLM-administered public lands.
- Firefighter and public safety are dependent on access and wildland fire behavior. Fire behavior is dependent on fuel loadings (including invasive species), and stand structure.
- Vegetation treatments will be designed to reduce FRCC by one condition class (i.e. FRCC 3 would go to FRCC 2) after treatments.
- Category "A" polygons in each Fire Management Unit will only receive mechanical or chemical treatments and will lose the benefits of fire.
- Category "D" polygons in each Fire Management Unit will have the most flexibility.
- Acres in Fire Regime Condition Class (FRCC) 1 will remain in FRCC 1 during the 20-year analysis period.

Cultural and Paleontological Resources

- Federal undertakings and unauthorized uses have the potential to cause irreversible disturbance and damage to non-renewable cultural and paleontological resources. BLM would continue to mitigate impacts to both resources from authorized uses through project abandonment, redesign, and if necessary data recovery investigations in accordance with the BLM National Cultural Programmatic Agreement, the Protocol for Managing Cultural Resources on Land Administered by the BLM in Montana, and Manual Series 8270 for paleontology.
- Without a 100 percent inventory of all public lands within the Decision Area, the exact number, kind, and variability of cultural and paleontological resources will be unknown. However, new sites and

localities would continue to be found and evaluated for eligibility for the National Register of Historic Places, and scientific significance, as additional inventories are completed for compliance on projects. Eligible cultural resources and significant localities would continue to be treated similarly and equally in terms of type, composition, and importance, but many would continue to deteriorate through natural agents, unauthorized public use, and vandalism. The BLM would continue to consult with Native American Tribes on traditional cultural properties and values that are of concern to them.

- All archaeological resources will be assessed according to BLM use categories. The demand for use of cultural resources is expected to increase. Interest from the general public in historical tourism and from Native Americans for traditional uses is expected to increase. The demand to use cultural resources by the academic community in scientific research would be expected to remain at current levels.
- The same pressures associated with cultural resources would be occurring with paleontological localities. BLM Manual Series 8270 integrates legislated directives from the Antiquities Act of 1906, FLPMA, and NEPA, for the protection of resources of scientific interest; and as such, outlines available protection measures and mitigation procedures for paleontological localities.

Visual Resources

- As described in the Alternatives section in Chapter 2, short-term impacts on visual quality may occur for long-term resource benefit.
- Projects would be planned to meet VRM objectives and will result in VRM being met. For example, timber harvesting activities will consider the impacts on VRM, and mitigation would be included which would eliminate the long-term impacts of the timber harvesting on VRM.
- VRM objectives will be applied to all management actions and appropriate mitigation measures will be developed to ensure compliance with established visual resource classes except in cases involving threats to human life and property.

Forestry and Woodland Products

- Estimated Probable Sale Quantities (PSQs) are reasonably achievable based on budgets and staffing levels.
- PSQ is based on all forests with over 10 percent canopy except acres with protections including Wilderness Study Areas and VRM Class I areas.
- Adequate access for forest management will be maintained. Closure of roads due to travel management is reflected in the reduced acres of treatment proposed and anticipated PSQ.
- Land ownership adjustment would generally result in more consolidated land holdings by BLM, a reduction of isolated tracks needing management, and a reduction in tracks with poor or no access.
- Forest management, silvicultural, and treatment terms used assume definitions described in: Dictionary of Forestry, John A. Helms, editor, 1998. Society of American Foresters publisher, ISBN 0-939970-73-2.

Livestock Grazing

- Under all alternatives, livestock grazing will be managed through implementation of the Standards for Rangeland Health and Guidelines for Livestock Grazing (**Appendix F**).
- Livestock grazing will be adjusted as appropriate to ensure wildlife habitat requirements are taken into account in accordance with the Butte Field Office RMP.
- During review of grazing leases and permits, appropriate management tools and guidelines for grazing management options will be considered and prescribed as necessary to improve the condition of riparian and wetland areas.
- Under all alternatives, a range of shrubland and grassland acres to be treated per decade is given. This analysis assumes the maximum number of acres will be treated.
- Under all alternatives, a range of acres to be treated for noxious weeds per decade is given. This analysis assumes the maximum number of acres will be treated unless otherwise stated.
- The cost of administering grazing allotments as forage reserve will be higher than administering them as normally permitted allotments.
- Any lands acquired from the Iron Mask Acquisition will be managed like the existing Indian Creek allotment as described under each alternative.

Minerals and Geology

- Demand for mineral commodities, construction materials and energy resources will increase in the U.S. and within the Planning Area.
- Increased demand for energy and minerals will encourage exploration for potential resources from areas of known high and moderate potential within the Planning Area.
- It is assumed there will be no major change in the legal framework under which mineral leasing, mining claim location, or mineral material sales are conducted.

- BLM will provide opportunities and ensure accessibility to mineralized areas for mineral exploration and development.
- BLM will ensure alternatives in this plan will not compromise valid and existing mineral rights, federal regulations, bureau leasing policies and procedures, and BLM mineral sales requirements.
- There will continue to be controversy surrounding mineral development associated with a range of societal pressures. This controversy will require more BLM federal land managers' time and resources as they attempt to move federal properties forward through mineral exploration, permitting, development, and oil and gas exploration and development drilling activities.
- BLM will provide for timely permit evaluation and processing of federal energy and solid mineral exploration and development proposals.
- Adequate numbers of trained mineral personnel and sufficient funding will be available for exploration permitting, environmental analysis, permitting, and oversight during operations and reclamation.
- Potential impacts of developing mineral resources described herein are based on analysis of the best available data. Specific knowledge of the Planning Area and best professional judgment, based on observation and analysis of geologic conditions and mineral and energy occurrence in similar areas are used to infer environmental effects where data is limited.
- Acreage figures, tonnage, and ore grade values and other numbers used in the analysis are approximate projections for comparison and analytic purposes only. Readers should not infer that they reflect exact measurements or precise calculations.

Leasable

- All federal mineral leases will be subject to standard lease terms.
- Oil and gas exploration will occur as described in the reasonably foreseeable development scenario (RFD scenario) which predicts that as many as 19 conventional oil and gas wildcat wells (exploratory wells drilled in an area with no existing production) might be drilled in the Butte Field Office Planning Area in the next 15 to 20 years. Of these 19 wells, it is estimated that 13 would be "dry" holes (no economically producible oil or gas is discovered). It is further estimated that six (6) of the wells could have oil or gas discoveries, two (2) of which would become producers with one located on either BLM minerals or lands administered by the Forest Service, and the other located on privately owned mineral lands. Each of the discovery wells would probably prompt additional step-out wells. A "step-out well" is a well drilled adjacent to or near a proven well to establish the limits and continuity of the oil or gas reservoir and/or to assist with production. It was estimated that 12 step-out wells would be drilled, two for each discovery. In all approximately 31 total conventional wells would be drilled. The amount of ground affected by this drilling activity would include surface disturbances from the construction of exploration drill roads and equipment staging areas (221 acres), and drilling pads (45.5 acres). Dry holes would be plugged and abandoned with reclamation of exploration drilling sites and access roads usually being completed within one to two years of drilling,
- The RFD scenario also forecasts the discovery and development of three conventional gas fields and one conventional oil field Planning Area-wide (including non-federal mineral estate). Discovery and development of these fields would include surface disturbances associated with drill pads (42 acres), access roads and staging areas (130 acres) and pipelines (318 acres). Although all surface disturbances could be reclaimed in the long-term, short-term reclamation would reduce the total area of surface disturbance to about 83 acres, two years after development of the fields.
- In addition to conventional oil and gas wells, it is anticipated that as many as 40 wells would be drilled for coal bed natural gas in limited and scattered areas of known sub-bituminous coal resources located in Gallatin and Park Counties; most likely in the Trail Creek Road area near Bozeman Pass (Livingston and Trail Creek Coal Fields). This activity is not forecast to occur on any federal mineral estate lands. It is forecast that two commercial fields would be discovered and require additional surface disturbances related to gathering and sales pipelines, and compressor stations.
- Exploration and development of two coal bed natural gas fields could include construction of four drill pads (one acre) and access roads (three acres). Reclamation would generally be completed within two years of completion of the dry holes. Discovery and development of the forecast two coal bed natural gas fields would include surface disturbances associated with 30 drill pads (7.5 acres, six discovery and 24 step-out wells), and access roads and pipelines that follow access roads (31.6 acres). This surface disturbance could be reduced to about 21.7 acres after short-term reclamation was completed. Based on projected well depths, it is assumed that produced water would be reinjected if technically possible and not disposed of on the surface. These activities are forecast on non-federal mineral estate lands.
- No federal geothermal leasing will likely occur in the Decision Area.

- None of the lands within the Sheep Creek, Sleeping Giant, Elkhorns Tack-on, Humbug Spires, or Yellowstone Island Wilderness Study Areas will be available for oil and gas leasing under any of the alternatives unless later released from their status as Wilderness Study Areas.

- Stipulation-specific acreages by alternative in tables 4-23, 4-27, 4-30, and 4-33 are presented for individual stipulations without consideration of overlap with other, potentially more protective (more restrictive of oil and gas exploration/development) stipulations. For example, a major constraint such as No Surface Occupancy (NSO) is generally a more protective stipulation for a resource than a moderate constraint such as Timing Limitations. In Table 4-27, a total of 498,973 acres of federal mineral estate lands are identified as having a Timing Limitation stipulation for big game winter/spring range. However, when mapped areas with major constraints (No Lease, or NSO stipulations) are overlaid onto these big game winter/spring range acres, approximately 236,443 of these acres would be protected with No Lease or NSO stipulations, while the remaining 262,530 acres would be protected with the Timing Limitation stipulation. In the case of the stipulation-specific acreages in these tables for "moderate" constraint stipulations (Timing Limitations, Controlled Surface Use), these numbers do not consider the overlap of "major" constraint stipulations (NSO, or No Lease areas), and they therefore underestimate the resource protection that would actually be provided for the subject resources if exploration and development were to occur. This effect is quantitatively assessed for moderate constraint stipulations that have substantial acreages associated with them: big game winter/spring range, bighorn sheep yearlong range, soil protection, and visual resource protection stipulations. It also plays a relatively minor role in at least one action alternative for other resources with moderate constraint stipulations, and with lower acreages associated with them such as sage grouse winter/spring range, grizzly bear denning habitat, gray wolf dens, and Special Recreation Management Areas.

Locatable

- Most mineral commodities are currently at record high values when compared with values over the last 25 years. It is assumed that commodity prices will fluctuate around the current price level or increase modestly in the future. It is assumed that sustained or increasing prices will generate interest in exploration and development of mineral properties.

- The three currently operating large-scale metal mines within the Planning Area (Montana Tunnels, Continental Pit, and Golden Sunlight Mines) will either continue to operate under their respective Plans of Operations for the remainder of their planned life (Continental Pit) or will apply for Plan Modifications that are ultimately approved to expand their operations and extend their mine-life (Montana Tunnels and Golden Sunlight Mine).

- Small-scale metal mining operations having less than 5-acres of surface disturbance are regulated by the state under a Small Miners Exclusion and by the BLM under a Plan of Operations. Active mineral exploration and mine development at this scale is expected to occur at varying levels of intensity within the Planning Area in the future.

- The Butte Field Office anticipates 4 to 10 placer mining operations operating under a Plan of Operations during any given year, with the actual number being a function of the price of gold.

- No exploration or development of phosphate resources will occur within the Decision Area.

- It is likely that modifications to the Plans of Operation will be sought for three currently operating limestone mines located on private (Montana City and Trident Quarries) and public lands (Indian Creek/Limestone Hills) within the planning area. The Indian Creek/Limestone Hills Mine is administered by BLM and DEQ, Trident and Montana City mines are administered by DEQ.

Salable

- Demand for sand and gravel, riprap, and other mineral construction materials will increase at a moderate but steady rate in the future.

- The community pit, for a flagstone material located near Montana City and Conda Mining, Inc., which operates the Pipestone Stone Quarry that produces crushed rock, are both likely to continue limited production into the foreseeable future.

- The demand for boulders for sale for landscaping uses is likely to grow substantially in the future as long as high human population growth rates continue in southwestern Montana.

- The two active slate building stone quarrying operations within the Planning Area, the Soap Gulch area north of Melrose and the Gates Stone Quarry, located in Towhead Gulch west of Holter Lake, are likely to see continued small-scale production into the foreseeable future. It is also likely that the travertine quarries located north of Gardiner would be reopened for limited production from time to time in the future. The Soap Gulch quarry is the only one of these mines located on BLM lands.

Recreation

- Demand for recreational use of public land is expected to increase in the future.

- Total visitor days, under the existing management, would increase about two-percent per year over the next 20 years.
- Increases are expected to be in water-based activities, hunting, fishing, rock climbing, hiking, wildlife viewing, and dispersed uses.
- Demand for developed recreation areas will increase, as will the demand of land for dispersed recreation.
- Developed recreation opportunities are described in detail in the management guidance for all alternatives.
- The amount of dispersed recreation opportunities were assessed by the approach each alternative took to managing the Recreation Opportunity Spectrum Settings and Special Recreation Management Areas.

Special Designations – Wilderness Study Areas

- Congress may legislate wilderness decisions in the future. Therefore, management strategies have been developed for the six WSAs should they be dropped from wilderness review under the action alternatives.

Special Designations – Wild and Scenic Rivers

- BLM can only recommend Wild and Scenic Rivers as suitable for possible designation by Congress. BLM will ensure that the outstandingly remarkable values associated with these areas are protected so that pending Congressional decisions are not compromised.

Travel Management and Access

- Roads that are currently classified, or are to be reclassified in the "Limited" designation will confine all motorized public travel to designated routes, with exceptions for the following:
- Dispersed camping will be allowed within 300 feet of existing roads open to full-size vehicle only (unless otherwise designated) by the most direct route (site selection must be made by non-motorized means).
- Firewood gathering will be allowed under permit.
- Visitor-use and demand is likely to continue to increase for both motorized as well as non-motorized users.
- Demand for adequate public and agency access to public lands will remain high in the future.
- Changes in OHV and snowmobile design and technology will continue, enabling OHV users to travel into areas that were once thought of as inaccessible due to terrain and water or soil features.

Transportation Facilities

- State and major county roads will continue to be maintained to current levels and that in general, county roads will not be abandoned.
- BLM facilities, mainly roads, will continue to be maintained with priority placed on those most heavily used by the public.
- Road maintenance will be conducted on routes designated as open yearlong and open with restrictions.

Social and Economic

- The planning area population will continue to increase as described in Chapter 3.
- Increased recreational demands, as described in the Recreation assumptions section will influence social aspects of the planning area.
- The social groups are defined to facilitate the discussion of social impacts. These discussions simplify what are often quite complex and unique values and attitudes and the groupings presented here are by no means mutually exclusive. For example, many ranchers also participated in recreation activities. It is also worth noting that personal attitudes, interests, and values often change over time. The social analysis will cover the groups and individuals that are most likely to be affected by this plan.
- Regional economic impacts are estimated based on the assumption of full implementation of each alternative. The actual changes in the economy would depend on individuals taking advantage of the resource-related opportunities that would be supported by each alternative. If market conditions or trends in resource use were not conducive to developing some opportunities, the impact on the economy would be different than estimated herein.
- Resource specialists projected annual resource outputs based on the best available information and professional judgment. The purpose of the economic analysis is to compare the relative impacts of the alternatives and should not be viewed as absolute economic values.
- All timber harvested within the analysis area would be logged by logging contractors, not households.
- Estimated PSQ outputs by alternative in the economic analysis are based on the upper end of the PSQ ranges described in Chapter 2 by alternative.
- Timber harvested within the analysis area would be distributed among the following sectors: sawmills and planning mills (90 percent), wood preservation (other manufacturing) (2 percent), veneer, and ply-

wood (5 percent), and prefabricated wood buildings (3 percent).

- The ratios of harvest to jobs and income used to assess the impacts of the alternatives are based on statewide ratios developed for Montana by the University of Montana.
- Baseline recreation demand is assumed to increase by two percent per year.
- Recreation visits are assigned to different user groups based on primary use. This does not account for the fact that recreation visitors may engage in one or more activity as part of a visit. Overnight visitors, who camp on Butte Field Office lands, for example, are identified as camping only even though they may also be pursuing a number of other different recreation activities.
- Projected recreation visits are distributed among different types of visitors based on the results of National Visitor Use Monitoring surveys conducted for the Beaverhead-Deerlodge, Gallatin, and Helena National Forests.
- The ratios of recreation visits to jobs and income used to assess the impacts of the alternatives are based on national ratios developed through the Forest Service's National Visitor Use Monitoring program.
- Non salary-related expenditures made by the Butte Field Office are assumed to be allocated to different economic sectors based on data compiled for the Beaverhead-Deerlodge National Forest.
- Public health and safety issues would receive priority consideration in the management of public lands.
- Demand for safe visits will increase with increasing numbers of public land users.

Social and Economic Analysis Methods and Issues

- The analysis area for the social and economic analysis consists of the eight southwest Montana counties that include lands managed by the Butte FO: Beaverhead, Broadwater, Deer Lodge, Jefferson, Gallatin, Lewis and Clark, Park, and Silver Bow counties.
- Potential economic impacts are assessed using the Forest Economic Analysis Spreadsheet Tool (FEAST) developed by the USDA Forest Service Inventory and Monitoring Institute (IMI) in Fort Collins, Colorado. This model uses a Microsoft Excel workbook as the interface between user inputs and data generated using the IMPLAN input-output modeling system.
- The FEAST analysis assesses the economic impacts of the resource outputs projected under each alternative. Resource outputs in this context are the amount of a resource (e.g., timber volume, AUMs, recreation visits, etc.) that would be available for use under each alternative. Average annual resource outputs were projected by resource specialists for each alternative for the planning period based on the best available information and professional judgment. Impacts to economic well-being are measured in terms of employment and labor income by resource area.
- Employment and labor income estimates developed for this analysis include direct, indirect, and induced economic effects. Direct employment would, for example, be generated in the logging and sawmill sectors. Additional employment would be generated as the affected logging and sawmill operations purchase services and materials as inputs ("indirect" effects) and employees spend their earnings within the local economy ("induced" effects).
- Non-market values, including natural amenities and quality of life, non-use values, and ecosystem services, are addressed under Effects Common to All Alternatives. Potential impacts are assessed in qualitative terms, as appropriate.
- Wildland fire suppression costs are addressed under Effects Common to All Alternatives. This section provides average fire suppression costs per acre by fire size class. These costs are not provided by alternative because it is not possible to predict the level of non-prescribed wildland fire that would occur under any of the alternatives.
- The social analysis assesses the potential effects of different management actions on potentially affected social groups. These groups were identified based on past studies in and around the planning area and the results of public scoping conducted for the Butte RMP. This analysis addresses the potential impacts of the alternatives based on the issues and concerns raised by these groups during the public scoping process. The analysis draws upon ongoing discussions between the BLM and potentially affected publics, as well as discussions with subject matter experts involved in other parts of the analysis. The analysis is primarily qualitative with potential impacts ranked by alternative. Quantitative measures, such as acres in protected areas, harvest volumes, and recreation visitation, are used, as appropriate.
- The environmental justice analysis presented under Effects Common to All Alternatives assesses the potential for the proposed alternatives to have disproportionately high and adverse human health or environmental effects on minority and low income populations. The fair treatment and meaningful involvement of people of all races, cultures, and incomes in this planning process is also considered.

Tribal Treaty Rights

- The BLM will continue to consult with Native American Tribes on issues relating to tribal traditional cultural properties and values.
- Interest from the general public in historical tourism and from Native Americans for traditional uses and practices is expected to increase.
- The BLM, as a governmental agency, will maintain special government-to-government relationships with federally-recognized Indian Tribes. Members of the seven recognized tribes in Montana such as the Blackfeet Tribe of the Blackfeet Reservation, Confederated Salish and Kootenai Tribes of the Flathead Reservation, and others tribes exercise their tribal treaty rights such as hunting, fishing, and gathering on non-tribal federal lands including those managed by the Butte Field Office. Native American treaty rights such as game fishing, hunting large and small game, and gathering natural resources for subsistence, medicinal, and cultural purposes are expected to continue and increase in the future.

EFFECTS ON RESOURCES

AIR QUALITY

Effects Common to All Alternatives

Under all alternatives, anticipated impacts on air quality from other resources, resource uses, or programs would be negligible to minor. An exception would be during periods of time when smoke from prescribed or wildland fires temporarily exceed air quality standards. This short-term impact could be analysis-area wide depending on the weather, location, number, and intensity of the fire(s) burning. Other potential sources of particulate emissions within the analysis area include dust from travel on unpaved roads, and dust and exhaust from construction or development activities.

Reducing the amount of forest and woodland subject to high severity impacts from wildland fire events by thinning, forest product removal, and prescribed burning methods would reduce the severity and extent of wildland fires and maintain air quality at desired future conditions to protect human health and the environment.

Burning slash in conformance with state air pollution regulations would continue to maintain the desired future condition goal of ensuring BLM authorizations and management activities comply with local, state, and federal air quality regulations, requirements, and implementation plans.

Particulate emissions of both types (PM_{10} and $PM_{2.5}$) within the analysis area are commonly produced during prescribed burns, wildland fire, private debris burning, agricultural burning, slash burning, and wood burning stoves and fireplaces. All of these activities can result in smoke and soot emissions. These emission situations are generally transitory and do not pose significant risks to human health because exposures can often be minimized or avoided. However, smoke from large fires, especially the fine particulate fraction ($PM_{2.5}$), can traverse great distances, sometimes thousands of miles, and can impact visibility in nearby and even distant Class I areas. Air quality and visibility can also deteriorate locally due to temporary climatological air stagnation events. Vegetation and fuel management activities that reduce the severity and extent of wildland fire would reduce impacts on visibility and the release of fine particulates throughout great distances.

Management of all resource uses to meet the Land Health Standards for air quality would maintain compliance with requisite measures for Prevention of Significant Deterioration in Federal Class I areas, such as Yellowstone National Park.

Striving to meet state and federal air quality standards in the interest of protecting human health potentially impacted by fugitive dust emissions, and meeting air quality standards for fugitive dust emissions from hazardous materials, would continue to meet the desired future condition goal of ensuring BLM authorizations and management activities comply with local, state, and federal air quality regulations, requirements, and implementation plans.

Current data indicate that both the National and Montana ambient air quality standards are currently met throughout most of the analysis area with the exception of several urban non-attainment areas within the analysis area. These non-attainment areas are guided by the state and are not within the jurisdiction of the BLM. Current BLM management practices are adequately ensuring compliance with current regulations, will not further degrade non-attainment areas, and meet the desired future condition.

Effects of Alternative A

Smoke created from prescribed burning could have short-term impacts on air quality within the local airshed. However, these impacts would be minimized by burning under controlled conditions. Prescribed burns that reduce the extent and intensity of wildfires would benefit air quality. Wildfires can produce greater impacts then prescribed fire since they can occur in less desirable conditions which can create larger more severe fires, producing more smoke, over longer periods of time.

Effects of Alternative B

Due to an increase in area potentially treated by prescribed fire producing more smoke, this alternative could have more short term impacts to air quality than Alternative A. However, by treating more acreage under controlled conditions, this alternative would reduce the

risks associated with wildfires during which smoke impacts to air quality could be severe.

Effects of Alternative C

Due to a reduction in area potentially treated, this alternative would result in less short term smoke related impacts than with Alternative A. However, by reducing the amount of fuels treated under controlled conditions, the risk of more large, severe wildfires would increase. The potential for smoke created from high severity wildland fire could be greater because this alternative treats the fewest acres for fuels reduction, leaving more acres available for high severity wildland fire.

Effects of Alternative D

This alternative would result in impacts very similar to alternative A. However, where fires are allowed to burn for resource benefits there could be slightly more long-term negative impacts on air quality within the airshed.

Soil Resources

Effects Common to All Alternatives

The following discussion addresses key soil concepts that are fundamental to understanding the discussion of effects to soils.

The main characteristics for evaluating the overall condition of soils are soil/site stability and hydrologic function. Soil/site stability reflects the capacity of a representative site to limit redistribution and loss of soils (including nutrients and organic matter) by wind and water. Hydrologic function reflects the capacity of the site to:

- Capture, store, and safely release water from rainfall, runoff, and snowmelt;
- Resist a reduction in this capacity; and
- Recover this capacity following degradation.

The following processes can be influenced by management activities:

- Soil compaction results from vehicles, construction equipment, people, and animals traveling over trails or land. Compaction can lessen the amount of precipitation that can infiltrate into soil and increase runoff, erosion, and sedimentation – in turn decreasing soil/site stability and hydrologic function, as well as soil productivity and plant vigor and diversity.
- Interception of precipitation results when precipitation falls on vegetation. When vegetation is removed, precipitation falls directly on the soil. This can increase surface erosion and sedimentation, and decrease the amount of time between initial precipitation arrival and peak surface runoff – in turn decreasing soil/site stability and hydrologic function.
- Infiltration is the process of precipitation entering and traveling through soil. Infiltration reduces the peak runoff during precipitation events by extending the period of runoff after a precipitation event. Infiltration also filters precipitation and reduces erosion and sedimentation. Most importantly, infiltration provides for moisture availability, which allows for the continued development of the soil profile. If infiltration is reduced, runoff and erosion will increase and soil/site stability and hydrologic function – as well as soil moisture availability, soil productivity, plant vigor and diversity – will decrease.
- Runoff can affect the amount of erosion and sedimentation, as well as flooding – both onsite and offsite. If runoff is increased, all of these effects can increase and soil/site stability and hydrologic function-as well as moisture availability, soil productivity, and plant vigor and diversity-will decrease.
- Erosion and sedimentation affect soil/site stability and hydrologic function. Erosion and sedimentation can destabilize the surface and subsurface cohesion of the soil. Increased sediment entering water bodies' increases turbidity, increases width-to-depth ratios, and consequently increases temperature and dissolved oxygen saturation levels, and creates an adverse habitat for aquatic animals and plants.

If not properly managed, ground disturbance (such as road construction, maintenance, and use; mining activities; vegetation management activities) can lead to erosion and sedimentation, with associated degradations in soil/site stability and hydrologic function, as well as soil productivity and plant vigor and diversity.

The physical, chemical, and biological processes that occur in rangeland soils supply plants with nutrients and water. Microorganisms in the soil break down plant litter, releasing nitrogen, phosphorus, and other nutrients essential for plant growth. The texture, structure, and porosity of soil determine how much rain is captured and how much runs off during a storm. Soils are storehouses of water and nutrients for plants to draw on when they need them. The soil is a living system that is inextricably linked to nutrient cycles, energy flows, and other ecological processes of rangeland ecosystems.

Of the three principal processes involved in soil degradation—physical, chemical, and biological—livestock grazing may impact soils physically or biologically. Livestock grazing can compact soils where trampling or excessive trailing occurs. Wind or water erosion of soils may be accelerated if insufficient litter or plant cover is left after the grazing season, or if plant composition is changed by grazing practices. Soil structure can be affected by livestock grazing if biological or physical soil crusts are excessively damaged. Overgrazing can reduce the amount of organic matter, the carbon storing ability, and the kinds and numbers of microorganisms living in soils.

The following qualitative analysis of effects to soils is based on soil information for the Butte Field Office and on professional judgment. Effects to soils described above would occur to varying degrees by RMP alternative relative to the amounts and types of proposed activities by alternative. References to "effects to soils" in discussions below by alternative relate to the specific effects described above. Proposed management of the following resources, resource uses, or programs would have no anticipated impacts on soil resources: air quality, cultural resource, fisheries, paleontology, special status species, visual resources, wildlife, ACECs, wild and scenic rivers, wilderness study areas, economics, environmental justice, Indian trust resources, and social.

On Decision Area lands, the primary locations where soil compaction is occurring are roads, trails, and livestock trails. Many Decision Area soils have too many rock fragments for compaction layers to form.

Historically, some Decision Area lands were grazed by livestock excessively, reducing litter and ultimately changing plant composition which led to accelerated soil erosion. Due to modified livestock grazing practices, the extent of these impacts have been reduced in recent decades. However, localized areas where livestock congregate, particularly watering sites, livestock trails, and riparian areas, still have soil impacts described above.

Restoring vegetative communities to more historic conditions would have long-term benefits to soil stability by re-establishing more natural rates of interception, infiltration, runoff, and erosion processes.

Ground disturbance associated with timber harvest, vegetation treatments and fire management activities would generate accelerated soil erosion in the short to mid-term, and could increase soil compaction. Project design measures for these activities would contribute to the protection of soil resources and meeting the desired future condition of maintaining stable soil. Meeting the desired future condition in the long-term with these treatments would contribute to properly functioning watersheds that support productive plant communities consistent with site potential in the long-term. Requiring all forest resource uses and silvicultural practices to meet or move toward meeting Land Health Standards would contribute to properly functioning watersheds and support productive plant communities consistent with site potential.

Implementation of prescribed burning, mechanical treatments, or other appropriate methods to restore desired ecological conditions to grassland and shrubland communities would contribute to soil stability and soil productivity in the long-term.

Wildland fires change the physical, chemical, and biological properties of the soil. Severity of the impact would depend on the fuel type, duration, and fire intensity. Severe wildland fires decrease soil infiltration rates, cause accelerated erosion, and remove some nutrients. Reduction of the extent and severity of wildland fires through prescribed burns and forest thinning while following the Montana Forestry Best Management Practices (DNRC 2004b) would reduce negative impacts on soil from severe wildland fire in the long-term. Effects to soils would generally occur to a lesser extent in areas of prescribed burning than in areas of wildland fires.

Protective measures for riparian areas would contribute to the protection of soil resources and meeting the desired future condition. Streambank erosion would be reduced in riparian areas that achieve proper functioning condition. Riparian areas in proper functioning condition have plants whose root masses are capable of withstanding high flow events and preventing streambank erosion.

Monitoring riparian and wetland areas for proper functioning condition would provide information needed to apply appropriate mitigation measures to protect soil resources.

Implementation of the Standards for Rangeland Health and BMPs would improve plant vigor and litter accumulation causing beneficial changes in organic matter content, soil structure, permeability, and productivity. Impacts on soils from management of abandoned mines and hazardous materials could also be short term if reclamation were conducted in accordance with the National Oil and Hazardous Substance Pollution Contingency Plan. Implementation of the guidelines for livestock grazing under "Standards for Rangeland Health" would benefit soil resources.

Restricting livestock grazing on the river shoreline north of Homestead Pasture in the Sleeping Giant ACEC from Memorial Day weekend through Labor Day weekend could result in an improvement in streambank stability and soil infiltration capacity.

Meeting or moving toward meeting Land Health Standards when planning for travel management would benefit soil resources by minimizing soil erosion and closing or eliminating unneeded roads.

Road and trail construction would create areas with some short-term and potential long-term accelerated soil erosion. Accelerated soil erosion from road construction, maintenance, and use would be minimized and mitigated through the changes in travel planning and management practices.

Implementing BMP's at recreation sites could help meet Land Health Standards and benefit soil resources by minimizing ground disturbance to the extent necessary at these sites.

Requiring that all new leases, permits, rights-of-way, and easements be permitted in a manner consistent with meeting Land Health Standards would benefit soil resources by mitigating construction-related impacts on soil stability.

BLM actions to reduce or prevent accelerated soil erosion, mass movement, and streambank instability would enhance soil stability. BLM actions that would contribute to properly functioning watersheds and support productive plant communities include soil stabilization management practices and actions that preserve soil organic material and prevent or reduce soil contamination and soil compaction.

Effects of Alternative A

Treatment of up to 5,250 acres of grassland and shrubland habitat; up to 5,100 acres of dry forest; up to 2,400 acres of cool, moist forest; and up to 30 acres of riparian areas per decade to restore vegetation communities would subject these acres to increased soil erosion and in some cases soil compaction effects described above under Effects Common to All Alternatives. Short to mid-term adverse effects to soils would likely be greater than with Alternative C but less than with Alternatives B and D. Long-term benefits to soil resources associated with restored vegetative communities follow the same pattern with Alternative A having greater benefits than Alternative C, but less than Alternatives B and D.

In Alternative A, there would be no seasonal restrictions on when prescribed fire could be implemented if in prescription. There could potentially be times when prescribed fire occurs in the summer months which may have more negative effects on soils than if burning occurs in cooler, moister spring or fall months.

Alternative A provides for approximately 7,300 acres in Fire Management Unit (FMU) designation "A" where wildland and prescribed fire is not desired. Fuels reduction treatments on these acres would be by mechanical methods without the use of prescribed fire. Because prescribed fire would not be used in these areas, a greater degree of ground disturbance may occur during fuels reduction treatments than in areas with other FMU designations. Soils may be subjected to greater ground disturbance related effects. Fire suppression response in these areas may also lead to more ground disturbance and associated impacts to soils because wildland fire is not desired and suppression tactics may be more aggressive in nature than in areas with other FMU designations.

Overall, Alternatives A and D would have greater impacts to soils (described above under Effects Common to All Alternatives) associated with livestock grazing than either Alternatives B or C. Livestock grazing would occur on approximately 273,000 acres in Alternatives A and D, 265,000 acres in Alternative B, and 262,000 acres in Alternative C. Managing livestock grazing in the McMasters Hills, Spokane Hills, and Indian Creek allotments as available for general grazing permits in Alternative A would impact soil resources greater than in Alternatives B and C, but the same as in Alternative D.

Alternative A allows for general grazing permits in eight allotments (Centennial Gulch, Free Coinage, Alder Creek, Charcoal Mountain Custodial, Dickie, Maiden Rock Custodial, Quinn Creek, and Wineglass Mountain) where grazing would not be allowed in either Alternatives B or C. With the exception of the Centennial Gulch allotment, these other allotments are generally on steep, forested terrain. Livestock use in these allotments would likely be transitory with relatively few soils impacts associated with them. With the continued implementation of Rangeland Health Standards, impacts to soils in the Centennial Gulch allotment would likely be limited to riparian, trailing and congregation areas.

Under current conditions (Alternative A), approximately 172 miles of motorized routes mapped on the BLM transportation system would remain closed. Impacts to soil resources described above under Effects Common to All Alternatives would reduce over time on these routes as they revegetate and soils stabilize.

The Controlled Surface Use (CSU) stipulation for oil and gas exploration and development on slopes greater than 30 percent on non-Boulder Batholith soils, or greater than 20 percent on Boulder Batholith soils, or areas of mass wasting would be in effect on 249,137 acres Decision Area-wide. Under Alternative A, soils on approximately 120,133 of these acres would be even more protected by overlapping NSO stipulations or No Lease areas, leaving about 129,004 acres protected by the CSU stipulation.

Other effects of Alternative A are described under Effects Common to All Alternatives.

Effects Common to Action Alternatives

Implementation of a vegetation restoration program incorporating commercial harvests of forest products would contribute to soil stabilization in the long-term. Treatment of dry forest types and conifer-encroached grasslands and shrublands should reduce the soil erosion occurring in juniper dominated habitat types by increasing grass and shrub communities which would reduce the amount of bare ground. Redesigning, closing, or decommissioning roads that do not meet Land Health Standards could benefit soil resources by reducing soil erosion and compaction.

Consideration of habitat type, soils, fuel conditions, project objectives, and risk when planning prescribed fire would mitigate impacts on soil from burning.

Sites dominated by noxious weeds tend to have greater soil erosion than sites dominated by native vegetation. Active public education efforts and vegetation restoration activities proposed in Alternatives B, C, and D to control noxious weed spread could benefit soil resources by minimizing the spread of noxious weeds.

Provisions for erosion control through road management decisions would be more protective than existing requirements. Requiring road management activities to

meet, or move toward meeting Land Health Standards, including minimizing road and landing locations in RMZs; minimizing sediment delivery to streams from road surfaces; outsloping roadway surfaces where possible, and routing road drainage away from potentially unstable stream channels, fills and hillslopes would result in the protection of soil resources. Changes in designations from "Open" to "Closed" or "Limited" for routes that have accelerated soil erosion would benefit soil resources.

Requiring that relinquished allotments be subject to the maintenance of riparian values before re-offering the allotment for permit or lease would increase the likelihood that allotments adversely affecting water resources would not be reissued, or would be reissued with additional soil stability protection requirements.

Reseeding of disturbed areas where needed would contribute to soil stability.

Requiring the application of BMPs to minimize overall environmental impacts when issuing land use authorizations could improve soil stability through erosion control measures.

Watershed restoration projects designed to meet riparian standards would positively affect soil resources by moving toward proper functioning condition for riparian areas.

Change of existing travel management designations from "Open" to "Limited" for some roads in the Elkhorn Mountains, the warm-up area in the Whitetail-Pipestone area, and a portion of the 450-acre Radersburg OHV use area would result in the reduction of use intensity of some roads. This could have positive effects on soil stability through reduction in land use intensity and a lessening of effects to soils associated with ground disturbance described above under Effects Common to All Alternatives.

Continued route evaluations for site-specific TPAs using a repeatable, systematic process could result in the closure of additional roads exhibiting accelerated soil erosion.

Reduction of soil mass movement from burned areas, aboveground disturbances (primarily roads), and accelerated streambank erosion would positively impact soil resources by stabilizing soils.

Requiring erosion protection practices maintain, protect, or minimize disturbances to resources for all mineral operations would reduce the impact of surface disturbance on soil stability.

Effects of Alternative B

Treatment of up to 11,800 acres of grassland habitat; up to 3,650 acres of shrubland habitat; up to 14,750 acres of dry forest; up to 3,750 acres of cool, moist forest; and up to 700 acres of riparian areas per decade to restore vegetation communities would subject these acres to increased soil erosion and in some cases soil compaction effects described above under Effects Common to All Alternatives. These short to mid-term adverse effects to soils would be greater under Alternative B than under Alternatives A and C, but less than under Alternative D. Long-term benefits to soil resources associated with restored vegetative communities would be greater under Alternative B than either Alternatives A or C, but less than under Alternative D.

In Alternative B there would be seasonal restrictions on when prescribed fire could be implemented, generally limiting application of prescribed fire to cooler, moister spring and fall months. This would lead to cooler, less severe prescribed burns, and could limit adverse effects on soils compared to Alternatives A and D where no seasonal restrictions would be applied. .

Overall, Alternative B (grazing on approximately 265,000 acres) would have greater impacts to soils associated with livestock grazing than Alternative C (approximately 262,000 acres), but less than Alternatives A and D (approximately 273,000 acres). Managing livestock grazing activities in the McMasters Hills, Spokane Hills, and Indian Creek allotments as forage reserve allotments in Alternative B would impact soil resources less than in either Alternatives A or D where they would be managed as available for general grazing permits. Alternative B would pose a greater impact to soils in the Indian Creek allotment than Alternative C in which the Indian Creek allotment would be unavailable for grazing but where McMasters and Spokane Hills allotments would be managed as forage reserve allotments as in Alternative B.

There would be no impacts to soils from livestock grazing in the Centennial Gulch, Free Coinage, Alder Creek, Charcoal Mountain Custodial, Dickie, Maiden Rock Custodial, Quinn Creek, and Wineglass Mountain allotments in Alternative B as these areas would be unavailable for grazing. Alternative C manages these areas the same as Alternative B and would therefore also have no livestock grazing-related impacts. Alternatives A and D would manage these areas as available for general grazing permits and would have livestock grazing-related erosion and compaction impacts associated with them in these areas.

Alternative B would close or decommission approximately 371 miles of routes in the Decision Area currently open to use by motorized vehicles, the second most of any alternative. This reduction in ground disturbance should reduce soil erosion more than in Alternatives A and D, but less than in Alternative C.

Requiring weed and erosion control practices in burned areas having documented sedimentation where sedimentation is definitively impacting adjacent streams would minimize accelerated erosion resulting from loss of deep-rooted vegetative cover. This would be more pro-

tective of soil resources than Alternatives A and D, but less than Alternative C where any accelerated erosion in burned areas would be treated.

Allowing new roads and facilities for mining operations inside Riparian Management Zones only when an alternative does not exist would provide additional riparian soil protection beyond that provided in Alternatives A and D, but less than in Alternative C where no roads or facilities would be permitted in RMZs.

The Controlled Surface Use (CSU) stipulation for oil and gas exploration and development on slopes greater than 30 percent on non-Boulder Batholith soils, or greater than 20 percent on Boulder Batholith soils, or areas of mass wasting would be in effect on 249,137 acres Decision Area-wide. Under Alternative B, soils on approximately 112,585 120,133 of these acres (7,548 fewer acres than under Alternative A) would be even more protected by overlapping NSO stipulations or No Lease areas, leaving about 136,552 acres protected by the CSU stipulation.

Overall, Alternative B would pose more impacts to soil resources than Alternative C, but less than Alternatives A or D.

Effects of Alternative C

Treatment of up to 2,000 acres of grassland habitat; up to 750 acres of shrubland habitat; up to 4,800 acres of dry forest; up to 550 acres of cool, moist forest; and up to 200 acres of riparian areas per decade to restore vegetation communities would subject these acres to increased soil erosion and in some cases soil compaction effects as described under Effects Common to All Alternatives. These short to mid-term adverse effects to soils would be the least of all alternatives, but long-term benefits to soil resources associated with restored vegetative communities would be less in Alternative C than in any other alternative.

In Alternative C there would be seasonal restrictions on when prescribed fire and mechanical treatments could be implemented if in prescription. This could limit the effects on soils due to burning in the spring and fall when soil moisture is not as limited. It could also have the reverse effect with mechanical treatment by only allowing treatments in the spring or fall when the ground is wet and may cause more soil disturbance.

Alternative C has approximately 41,000 acres in the FMU designation "A" where wildland and prescribed fire is not desired. Fuels reduction treatments on these acres would be by mechanical methods without the use of prescribed fire. Because prescribed fire would not be used in these areas, a greater degree of ground disturbance may occur during fuels reduction treatments than in areas with other FMU designations. Soils may be subjected to greater ground disturbance related effects. Fire suppression response in these areas may also lead to more ground disturbance and associated impacts to soils because wildland fire is not desired and suppression tactics may be more aggressive in nature than in areas with other FMU designations.

Prohibiting timber harvests in Riparian Management Zones in Alternative C would prevent some ground disturbing activities that could result in soil instability. Alternative C would more likely result in greater soil protection in riparian areas than Alternatives A, B or D.

Restricting firewood cutting to beyond 200 feet of live streams and 100 feet of intermittent streams would provide for the most down woody material as long-term nutrients for soils in riparian areas compared to any other alternative where firewood management is less restrictive (100 feet beyond live streams, 50 feet beyond intermittent streams in Alternatives B and D, SMZ law guidance in Alternative A).

Impacts to soils from livestock grazing would be slightly less in Alternative C than in Alternative B because three allotments (Indian Creek, Dog Paw, Sixmile Park County) available as either forage reserve allotments or for general grazing permits in Alternative B would not be available for grazing in Alternative C. All of these allotments would be available for general livestock grazing permits in Alternatives A and D and would therefore have soil impacts associated with them in these alternatives. Alternative C poses the least impacts to soils due to livestock grazing of all the alternatives.

Alternative C would close or decommission approximately 425 miles of routes currently open to use by motorized vehicles. This reduction in ground disturbance associated with motorized routes would reduce impacts to soils more than in any alternative.

Requiring weed and erosion control practices in burned areas having accelerated soil erosion would be more beneficial to soil resources than any other alternative where weed and erosion control practices would not necessarily be required (Alternatives A and D), or would only be required where sedimentation is observed to be impacting adjacent streams (Alternative B).

Under Alternative C new roads and facilities associated with mining operations would not be allowed in Riparian Management Zones. This would be more protective of riparian soils than any other alternative where mining-related roads and facilities could be constructed in riparian areas under certain conditions.

The Controlled Surface Use (CSU) stipulation for oil and gas exploration and development on slopes greater than 30 percent on non-Boulder Batholith soils, or greater than 20 percent on Boulder Batholith soils, or areas of mass wasting would be in effect on 249,137 acres Decision Area-wide. Under Alternative C, soils on approximately 234,076 of these acres would be even more protected by overlapping NSO stipulations or No Lease areas, leaving about 15,061 acres protected by the CSU stipulation. In the context of oil and gas exploration and

development, Alternative C would pose the least impact to soils of all alternatives.

Overall, Alternative C would be the most protective and would create the least impacts on soils.

Effects of Alternative D

Treatment of up to 19,100 acres of grassland habitat; up to 6,800 acres of shrubland habitat; up to 18,200 acres of dry forest; up to 5,050 acres of cool, moist forest; and up to 1,700 acres of riparian areas per decade to restore vegetation communities would subject these acres to increased soil erosion and in some cases soil compaction. These short to mid-term adverse effects to soils would be greatest of all alternatives, but long-term benefits to soil resources associated with restored vegetative communities would also be greatest in Alternative D of all alternatives.

In Alternative D there would be no seasonal restrictions on when prescribed fire could be implemented if in prescription. There could potentially be times where prescribed fire occurs in the summer months which may have more effects on soils than if burn projects were implemented during cooler, moister spring or fall months.

Under Alternative D, allowing timber harvest in streamside management zones would be the same as under Alternative A (implementing streamside management zone BMPs) and would result in no additional protection to soil resources. Alternative D would be less protective than Alternatives B and C to soils in riparian areas.

Impacts to soils associated with livestock grazing would be the same as described for Alternative A.

Alternative D would close or decommission approximately 310 miles of routes currently used by motorized vehicles. This reduction in ground disturbance would reduce soil erosion more than in Alternative A, but less than in Alternatives B and C.

The Controlled Surface Use (CSU) stipulation for oil and gas exploration and development on slopes greater than 30 percent on non-Boulder Batholith soils, or greater than 20 percent on Boulder Batholith soils, or areas of mass wasting would not be in effect under Alternative D. Under this alternative these areas would be protected by standard lease terms and would be subject to greater potential soils impacts than under any other alternative.

Overall, Alternative D would create the greatest amount of impacts to soil resources of the action alternatives.

Water Resources

Effects Common to All Alternatives

Under all alternatives the BLM would strive to maintain or restore water quality to levels that fully support all achievable beneficial uses. However, water quality could still vary considerably while still meeting water quality standards. The following discussion describes potential water quality impacts that could occur following the implementation of any of these alternatives.

Water Quality is highly dependent on stream form and function. Key factors include stream flow characteristics, sediment characteristics, channel gradient, channel geometry, bank stability, floodplain connectivity, and channel and floodplain roughness. All of these factors should be able to function naturally and be characteristic of the local soil type, climate, and landform. Key characteristics of functioning streams include the following:

- Willows or other native woody vegetation should be present on those sites that are capable of supporting these life forms. In addition, sedges or other wetland/riparian species should be present on sites capable of supporting these plants. These locally adapted plants provide substantial root strength and are very effective at maintaining bank stability, trapping and filtering sediments, and filtering nutrients and fecal contamination. This vegetation should be vigorous and diverse.
- Riparian ground cover should be present at near natural levels. This would minimize the amount of exposed soils and the likelihood that these soils would wash into streams during precipitation events. A high level of ground cover would also increase sediment, nutrient, and bacterial filtration and prevent these materials from washing into the streams following hillslope and valley bottom disturbances.
- The stream water surface should have a high degree of shading, resulting in cooler water in summer and reduced icing in winter.
- Portions of the primary floodplain should be frequently flooded (inundated every 1 to 5 years).

By managing riparian areas and wetlands to be at, or moving towards, proper functioning condition (PFC), there should be improvements in water quality. For example, if a reach has a declining or static trend we'd expect sediment production (or nutrient, bacterial, and thermal inputs) to stay at or exceed current levels. Using the same logic, if trends were improving we'd expect lower levels of these pollutants. This is because improving trends suggests that banks are stabilizing and producing less sediment. In addition, since the condition of riparian vegetation and stream banks can both be used to indicate how much time livestock spends in or adjacent to streams, they can also be used to evaluate potential nutrient and bacterial inputs. If trends are improving, it is likely livestock are spending less time by water bodies and inputs of pollutants are decreasing.

Water quality is often influenced by processes and activities that take place in upstream areas of the drainage basin. In a natural system, the water quality of headwater areas depends mainly on the mineral composition of the

local geology as well as the types of rock and sediments that groundwater passes through on its way to the stream. Farther downstream, water quality becomes more influenced by land use and land management activities, including discharges from both point and non-point sources. Land management activities have the potential to affect the following key attributes: sediment, temperature, nutrients, pathogens, and dissolved oxygen.

Sediment is generated when soils are disturbed and then delivered to a water body. High concentrations of suspended sediment can cause many adverse consequences, including the following:

- Increased turbidity or impaired water clarity,
- Reduced light penetration,
- Reduced ability of predators that rely on sight to capture prey,
- Clogged gills of fish and aquatic invertebrates,
- Reduced fish spawning success,
- Reduced survival of juvenile fish

Other impacts such as smothering the benthic community and changes in the composition of the bed substrate could result when sediment is deposited in slow-moving receiving waters. Suspended sediment is also an efficient carrier of toxic organic substances and trace metals because these substances can bind to sediment particles. Once sediment falls out of suspension, pollutants in enriched bottom sediments can pose a risk to benthic life and the aquatic food chain.

In areas starved of sediment, increases in sediment can benefit channel geomorphology and development of aquatic habitat by creating spawning habitat and sites for vegetation to become established. Thus, not all sediment effects are negative.

Elevated water temperatures can substantially affect organisms adapted to a cold water environment. A rise in water temperature of only a few degrees over ambient conditions can reduce the number of or eliminate sensitive invertebrates and fish. Large daily fluctuations in temperature can also result in adverse effects.

Nutrients are needed for photosynthesis for supporting the requirements of organisms at higher trophic levels. In freshwater aquatic systems, the main nutrients are phosphorus and nitrogen. In particular, phosphorus is a controlling factor on photosynthesis in aquatic systems. High concentrations can stimulate the growth of plants and algae. Excessive growth of plants and algae can do the following:

- Reduce the aesthetic appeal of the water for recreational users,
- Clog the habitat used by other aquatic organisms,
- Cause large daily swings in dissolved oxygen concentrations, and
- Cause other nuisance conditions.

Waterborne pathogens could result in various adverse effects on warm-blooded animals drinking the water and even some possible adverse effects on human contact recreation activities. The main indicator of pathogens is the presence of coliform bacteria, which are microorganisms that live in the intestines of both warm- and cold-blooded animals, including humans. These bacteria enter the hydrologic system through fecal material that enters into water bodies. The presence of fecal coliform can also show that other harmful bacteria or viruses might be present. Fecal coliform bacteria in water bodies on BLM-administered lands are usually a result of non-point sources of human and animal waste (both domestic animals and wildlife).

The amount of oxygen that can be dissolved in water differs with temperature. Cold water can contain more dissolved oxygen than warm water. The amount of dissolved oxygen present in relation to the amount that could be dissolved at a given temperature is referred to as the saturation level. Decomposition of organic matter by microorganisms depletes levels of dissolved oxygen in slow-moving receiving waters and lakes and reservoirs. When dissolved oxygen levels drop too low, waters can become uninhabitable for aquatic organisms and might result in fish kills. Factors resulting in increased dissolved oxygen levels include the following:

- Physical mixing and agitation of the water (aeration),
- Photosynthetic production of oxygen by aquatic algae and plants, and
- Lower water temperatures.

The vegetative structure of communities dominated by noxious weeds is often less effective at providing protective ground cover than those dominated by native vegetation. Therefore, uplands or riparian areas dominated by noxious weeds will often see increases in erosion and sediment production. Noxious weed-dominated communities are also less effective than native communities at providing bank stability and sediment and nutrients filtration. The following effects are specific to these alternatives and would occur. Proposed management of the following resources or programs would have no anticipated impacts on water resources: cultural resources, paleontology, visual resources, wilderness study areas, economics, environmental justice, Indian trust resources, social and economic environment, and tribal treaty rights.

Requiring actions on Decision Area lands to be consistent with Land Health Standards (designed to prevent non-point source water pollution) would positively affect water resources. The degree to which water resources would benefit depends on the site's physical and ecological potential, the required management practices, and the extent of use restrictions.

Of the 346 miles of riparian vegetation along rivers and streams in the Decision Area, 150 miles are in proper functioning condition (43%), 147 miles are functioning at risk (42%), 40 miles are non-functional (12%), 1 mile is unknown (<1%), and 8 miles are woody draws (2%). Actions that contribute toward achieving proper functioning condition for riparian areas would positively impact water quality as noted in the discussion above on stream form and function.

Ground disturbance associated with road construction, vegetation or fuel treatments, livestock grazing, watershed restoration, recreation site development, and small scale minerals operations would have the potential to create short to mid-term impacts to water quality as described above (primarily from sediment). However poorly placed livestock facilities, poorly located roads and trails, ongoing road use and maintenance, and large scale minerals operations would have the potential for long-term impacts (primarily from sediment) as described above.

Roads and trails in riparian areas could produce long-term sediment impacts and could also alter the physical stream channel. By evaluating existing roads and trails for conformance to Land Health Standards, and closing those that are substantially contributing to non-conformance, there could be a long-term sediment reduction. This could produce a moderate to major long-term benefit to water quality.

Road or bridge construction and maintenance is the most frequently listed (303d list) cause for water impairment in the Planning Area (on BLM). Requiring road management to meet, or move toward meeting, Land Health Standards would further protect or improve water resources. This is especially true in watersheds that contain streams impaired due to road construction and maintenance. On Butte FO managed lands, approximately 35 miles of stream segments are listed due to road-related activities. These stream segments are within the following watersheds: Big Hole River (18 miles), Jefferson River (4.9 miles), Boulder River (3.7 miles), and the Upper Missouri River (8.8 miles).

Reducing the backlog of identified deferred road maintenance projects could contribute to the reduction of pollutants to surface water from erosion.

The development of silvicultural practices to contribute to meeting Land Health Standards would positively affect water quality by moving toward, and maintaining proper functioning condition of drainages or watersheds from a water, sediment, and nutrient routing perspective

The use of State of Montana BMPs to address non-point source water pollution and compliance with the Montana Water Quality Act would provide protection to water resources. Specific projects would be reviewed on a case-by-case basis to mitigate impacts to water quality and to minimize potential impacts to public health, safety, recreation, wildlife, birds, fish, and livestock. The level of protection would depend on the needs of the resource at risk and the extent to which the BLM is a land manager in a given watershed.

Collaboration with the MDEQ and local communities in the development of Water Quality Restoration Plans and Source Water Protection Plans could contribute to the restoration of up to 77.3 miles of impaired river segments in the Decision Area. The degree to which water resources would benefit would depend on the level of participation by the BLM, MDEQ, and watershed groups; as well as plan implementation, monitoring, and enforcement.

Watershed restoration projects designed to meet riparian standards would positively affect water quality by moving the watershed and riparian areas towards proper functioning condition.

Use of emergency fire rehabilitation funds to protect water resources could help maintain water quality by reducing sedimentation. This includes reducing sediment delivery from soil mass movements, surface erosion, and accelerated streambank erosion.

On abandoned mine lands the implementing of reclamation projects would benefit water quality by reducing heavy metal concentrations. On Butte FO managed lands approximately 49 miles of stream segments are listed due to AML-related sources. These stream segments are within the following watersheds: Big Hole River (10.7 miles), Jefferson River (2.9 miles), Boulder River (11.5 miles), Upper Missouri River (22 miles), and the Blackfoot (1.9 miles).

Assessment of proposed mine waste repositories to determine potential impacts on soil and water resources would provide additional protection to water resources if proposed repositories are required to adhere to BMPs adequately protective of water resources.

Maintaining existing water rights to ensure water availability for multiple-use management and proper functioning riparian and upland areas would reduce dewatering of surface water. This is important as pollutant concentrations and routing is dependent on flows.

Requiring users to obtain all necessary permits pertaining to water quality, wetlands and streams, and managing rivers to maintain sufficient flows and water quality to comply with the MDEQ Water Quality Standards would provide additional protection of water resources.

Some potential exists for contamination of subsurface aquifers during oil and gas drilling and production operations. This potential is mitigated by the casing and cementing requirements of Federal Onshore Oil and Gas Order No.2. This order specifies that all usable water zones must be protected. Protection involves setting and cementing casing through usable water producing sections encountered during drilling. All oil and gas wells are required to have cement placed in the annulus to ensure no cross-contamination of the aquifers. This

would prevent drilling fluids, as well as fluids and gases from other formations encountered in the wellbore from contaminating aquifers. This measure, when properly completed, adequately mitigates the anticipated impacts to ground water. The BLM reviews, and modifies as needed, each proposed drilling program to determine the adequacy of the casing and cementing program. A cement bond log may be required to verify the integrity of the cement.

Operators of onshore federal and Indian oil and gas leases must comply with Onshore Order No. 7 prior to disposal of produced water. Produced water is often highly saline and the potential exists for contamination of surface and ground water, soil and vegetation. The Onshore Order provides requirements and standards for the protection of surface and subsurface resources. Injection wells that are used to dispose the produced water must be approved by the Montana Board of Oil and Gas Conservation under the Underground Injection Control program. Information submitted in support of obtaining a underground injection control permit is accepted by the BLM in approving the disposal method, provided the information submitted in support of obtaining such a permit satisfies all applicable BLM statutory responsibilities and relevant requirements (including but not limited to drilling safety, down hole integrity, and protection of mineral and surface resources). Migration of produced water from the intended disposal zone and leakage to a usable water zone could occur upon failure of the casing and the equipment used to isolate the disposal zone (tubing and packer). There are numerous standards to insure that underground injection wells do not result in pollution of usable water sources, including periodic pressure testing of well casing, tubing, and packers to confirm integrity of the system and isolation of disposal zones.

Plugging programs for abandoned wells are designed to secure the well bore and prevent contamination to mineral or water bearing formations. Cement is pumped into the wellbore to seal any perforations. Cement is also pumped into the wellbore at certain formations to act as plugs to prevent migration of any fluids or gases that might enter the wellbore.

The Fluid Minerals Appendix (**Appendix M**) includes a more complete description of drilling operations, disposal of produced water and abandonment procedures, and the measures employed to protect usable water.

Striving to meet state and federal water quality standards in watersheds impacted by historic mining would move water resources toward proper functioning condition.

Effects of Alternative A

The treatment of up to 5,250 acres of grassland and shrubland habitat; up to 5,100 acres of dry forest; up to 2,400 acres of cool, moist forest; and up to 30 acres of riparian areas per decade to restore vegetation communities could result in increased soil erosion and in some cases, localized and minor short term sediment impacts (as described above in Effects Common to All Alternatives). However, there should be long-term benefits, as restored vegetative communities would lead to a more natural ground cover and reduced fuel loadings (lowering the risk of damaging high severity fires).

To reduce potential short term impacts associated with vegetative treatments, these actions would be subject to the Montana Streamside Management Zone (SMZ) Act. This law places restrictions on activities within 50 feet of streams with sideslopes less than 35 percent and 100 feet on streams with sideslopes greater than 35 percent. While the SMZ regulations would offer water quality protection, some vegetation removal could still occur within these areas. These disturbances could cause minor increases in water temperature; decreases in the amount of woody material delivered to the stream, and could cause local stream bank disturbances. These impacts would be partially mitigated through the implementation of site specific BMPs.

Livestock grazing would continue on approximately 273,000 acres. This could lead to additional inputs of sediment, nutrients, fecal contamination, and thermal loading. However, these inputs should be reduced (from current levels) through the implementation of grazing practices designed to ensure that riparian areas are either properly functioning or seeing improving trends.

Under current conditions (Alternative A) approximately 172 miles of motorized routes, mapped on the BLM transportation system, would remain closed (665 miles of roads and trails open to motorized use). Over time, erosion and sediment delivery would likely be reduced as these closed routes revegetate and soils stabilize.

Generally, road density is an indicator of overall watershed health and function. Watersheds with higher road densities tend to have lower water quality due to greater potential for erosion and subsequent sedimentation. Road density also is related to the distribution and spread of noxious weeds. Of all the alternatives, Alternative A maintains the most acres in high density roads (107,566 acres with greater than 2 mi/mi^2 road density) and the fewest acres in low density roads (116,236 acres with less than 1 mi/mi^2 road density).

Motorized routes within 300 feet of streams generally have greater potential to impact water quality through erosion and sedimentation, increased water temperatures (due to loss of shading vegetation), and direct alteration of stream channel morphology than those farther away. Under Alternative A, approximately 94.3 miles of motorized routes within 300 feet of streams would remain open to motorized use Decision Area-wide. This is the highest of any alternative and represents the greatest threat to water quality associated with motorized routes.

The continual unrestricted year-long motorized fording of the Big Hole River to access Sawlog Gulch would cause the most water quality impacts at this site relative

to any other alternative. However, this would be a localized short term impact

Managing to maintain Wild and Scenic River eligibility on all four eligible river segments (12 miles total in Upper Big Hole River, Upper Missouri River, Moose Creek, and Muskrat Creek) would likely improve water quality protection in these segments by limiting activities within a ¼-mile corridor on either side of each stream or river.

Continuing stream restoration activities associated with past mining and grazing would contribute to the general improvement of water resources. While these activities could produce short term impacts (sediment production) the long-term benefits derived from restoring natural function would outweigh these impacts.

Mineral operations permits would stipulate requirements and BMPs necessary to avoid or minimize adverse effects on water resources from structures, support facilities, and roads developed in relationship to mining activities.

Mitigating impacts to the extent possible on natural resources from extraction or salable minerals from previously disturbed sites would contribute to the maintenance of water resource quality in the vicinity of quarry or collection sites.

In the context of oil and gas development, Alternative A stipulates No Surface Occupancy within 500 feet of reservoirs, lakes, ponds and intermittent streams, or within 1,000 feet of perennial streams and rivers. This would minimize effects to water quality by requiring large buffers to aquatic features.

There are approximately 146,477 acres of federal mineral estate in the following municipal watersheds: Missouri River Siphon, Tenmile Creek Drainage, Big Hole River Intake, and Moulton Reservoir. The Reasonably Foreseeable Development scenario (RFD) for oil and gas development identified five sub-areas within the federal mineral estate where oil and gas exploration and development would most likely occur. The combined area of these sub-areas is approximately 116,295 acres. Of this total acreage, approximately 11,784 acres are located within the municipal watersheds listed above. All of these acres are located in the Missouri River Siphon municipal watershed. Under Alternative A, standard lease terms would apply in municipal watersheds that would allow relocation of proposed activity up to 200 meters (656 feet) to protect water quality.

Effects Common to Action Alternatives

Managing riparian areas to provide the amount and distribution of large, woody material characteristic of natural aquatic and riparian ecosystems would help dissipate stream energy associated with high water flow, thereby reducing erosion and improving water quality. Riparian area management would also contribute to sediment filtering, capturing bedload, and aiding in floodplain development. Improvements in floodwater retention and ponding would also contribute to groundwater recharge.

Cooperating with federal, tribal, and state wildlife management agencies and private landowners to identify activities that adversely affect water quality would beneficially impact water resources by providing BLM with a better understanding of resource use effects on water resources.

The opportunistic enhancement or restoration of habitat for westslope and Yellowstone cutthroat trout, Arctic grayling, and other special status aquatic species would benefit water resources by increasing stream channel complexity thereby making streams more resilient in high flow events, and stabilizing streambanks where needed.

Locating and maintaining roads to reduce sedimentation and restore or maintain riparian vegetation would benefit surface water resources.

The change of existing travel management designations from "Open" to "Limited" for some areas in the Elkhorn Mountains, the warm-up area in the Whitetail-Pipestone area, and a portion of the 450-acre Radersburg OHV use area would result in the reduction of cross-country motorized use. This could have a positive effect on water quality through reduction in land use intensity, reduction of sedimentation, and other pollutants to surface water.

Continued route-by-route evaluations for site-specific TPAs using a repeatable, systematic process could result in the closure of additional roads exhibiting accelerated soil erosion, which could reduce the amount of sedimentation to surface water.

Closing the Humbug Spires Potential ACEC yearlong to all motorized travel, prohibiting the construction of new roads and trails, and mitigating erosion on the existing trails would provide additional protection to surface water resources from sedimentation.

Restrictions to livestock grazing along the river shoreline north of Homestead Pasture in the Sleeping Giant ACEC from Memorial Day weekend through Labor Day weekend would provide additional protection to surface water resources in this area from sedimentation, loss of riparian vegetation and nutrient and bacterial loading.

Prohibiting the extraction of salable minerals from the Humbug Spires Potential ACEC would reduce the likelihood of vegetation loss, road construction and use, and other activities that could result in sedimentation impacts to water quality.

The No Surface Occupancy stipulation for oil and gas exploration in wetlands, floodplains, and riparian areas would prevent direct impacts to water quality and would protect water quality. Standard Lease Terms would also apply in which locations of exploration facilities could be relocated up to 200 meters to avoid impacting water

quality. This would afford a similar level of water quality protection on lakes, ponds, reservoirs, and intermittent streams as Alternative A, but would generally be less protective than Alternative A on perennial streams and rivers. However, under specific alternatives additional NSO stipulations of various widths to protect streams with sensitive fish species and blue ribbon fisheries values would provide more protection of rivers and some streams than under Alternative A.

Monitoring water quality to establish baseline conditions, identifying areas of concern, and documenting progress from mitigation measures would enable land stewards to track impacts from resource uses and the effectiveness of BMPs on water quality.

Effects of Alternative B

While all alternatives would meet, or strive to meet, state water quality standards, Alternative B would produce better water quality than would Alternative A.

The treatment of up to 11,800 acres of grassland habitat; up to 3,650 acres of shrubland habitat; up to 14,750 acres of dry forest; and up to 3,750 acres of cool, moist forest per decade to restore vegetation communities could result in increased soil erosion and in some cases, localized and minor short term sediment impacts (as described above in Effects Common to All Alternatives). However, there should be long-term benefits as restored vegetative communities would lead to a more natural ground cover and reduced fuel loadings (lowering the risk of damaging high severity fires). These long-term benefits would be greater than those generated under Alternatives A and C, but less than those under Alternative D.

The establishment of Riparian Management Zones (RMZs), areas where the management emphasis would be on maintaining and restoring riparian processes, would increase water quality protection, when compared to Alternatives A and D. These RMZs are both wider and more protective than SMZs (used in alternatives A and D), as SMZs only apply to vegetative treatments. This could improve all aspects of water quality.

To achieve the maintenance and restoration of riparian function, mechanical treatment of up to 700 acres of riparian areas per decade could occur. This might create minor short-term sediment impacts (as noted under Effects Common to All Alternatives). However, improving the function of riparian areas would produce several long-term benefits to water quality. These long-term benefits would be greater than in Alternatives A and C (30 acres and up to 200 acres per decade, respectively), but less than in Alternative D (up to 1,700 acres per decade).

Overall, grazing related water quality impacts would be slightly reduced from alternative A (and also lower than Alternative D) because the McMasters Hills, Spokane Hills, and Indian Creek allotments would be managed as forage reserves rather than as general grazing areas. The total amount of lands grazed (265,000 acres) would also be lower than Alternatives A and D (273,000 acres).

There would be no impacts to water quality from livestock grazing in the Centennial Gulch, Free Coinage, Alder Creek, Charcoal Mountain Custodial, Dickie, Maiden Rock Custodial, Quinn Creek, and Wineglass Mountain allotments in Alternative B as these areas would be unavailable for grazing. This would represent a reduction in grazing related impacts from alternative A (and D) and an improvement in water quality. Overall, grazing related improvements would be slightly less than those achieved under Alternative C.

Under Alternative B aerial application of herbicides to treat noxious weeds would not occur within a minimum of 100 feet of streams or wetlands. This measure would be more protective of water quality than Alternative A (no protection), and less protective than Alternative D (no spray within 200 feet) and Alternative C (no aerial application of herbicides at all).

Actions by the BLM to ensure that water quality protection provisions are followed when permitting activities would positively impact water quality.

Alternative B would close or decommission approximately 371 miles of routes in the Decision Area currently open to use by motorized vehicles, the second most of any alternative. This reduction in ground disturbance would reduce soil erosion and should produce a moderate to high long-term benefit to water quality (compared to the current conditions).

Alternative B would provide more acres of low density roads across the Decision Area (131,982 acres with less than 1mi/mi^2 road density) compared to Alternative A (116,236 acres) and Alternative D (123,073 acres) but less than Alternative C (141,264 acres). In the moderate road density category (1 to 2 mi/mi^2 road density), Alternative B would produce nearly 4,000 more acres of this category compared to Alternative A and this alternative has almost 20,000 acres less in the high road density category (greater than 2 mi/mi^2 road density) than Alternative A. This would represent a reduction in risks, associated with watershed conditions, from the current management situation.

Although some new permanent roads would be allowed for long-term forest management and mineral entry, both permanent and temporary road construction would be kept to a minimum. In addition, temporary roads would be decommissioned within one year of use. Alternatives B and C would both provide many protections to streams including minimizing road locations in riparian areas, minimizing sediment delivery from road surfaces, outsloping road surfaces and minimizing disruption of natural hydrologic flow paths.

Under Alternative B, approximately 77.4 miles of motorized routes within 300 feet of streams would remain

open to motorized use Decision Area-wide. This is less than with Alternatives A and D (94.3 miles and 81.2 miles, respectively), but more than in Alternative C (73.7 miles). Alternative B would pose the second lowest threat to water quality (associated with roads in and near riparian areas) of all alternatives. It would also represent an improvement over existing conditions.

In the context of road design and maintenance, Alternative B would include measures such as minimizing road locations in RMZs, outsloping roadway surfaces where possible, routing road drainage away from streams, and installing stream crossing culverts to meet BLM standards of accommodating 25-year storm events. This is more protective of water quality and streams than Alternative A, slightly more protective than Alternative D, and less protective than Alternative C.

In the context of Wild and Scenic Rivers, Alternative B would provide more water quality protection than Alternative D (no rivers recommended as suitable), but less than Alternatives A and C. Alternative B would recommend Muskrat Creek (2.6 miles) and the Upper Missouri River (3.1 miles) as suitable for Wild and Scenic River designation. Designation and the subsequent Wild and Scenic River plans would likely protect water quality by minimizing ground disturbing activities within a ¼-mile corridor on either side of designated river segments. Alternative B would not recommend Moose Creek (4 miles) or the Upper Big Hole River (2.3 miles) as suitable for WSR designation whereas water quality in these two segments would be more protected in Alternatives A (managed to maintain eligibility) and C (recommended as suitable).

Under Alternative B, consideration to implement and meet pollutant reduction targets identified in Water Quality Restoration Plans (WQRPs) would be based on reasonableness, attainability, and available funding. This would provide more assurances that water quality would be improved than under Alternatives A and D which do not include specific provisions regarding WQRPs.

Increasing the likelihood of increasing or maintaining instream flows through consideration of water rights acquisitions (in both Alternatives B and C) could benefit water quality more than in Alternatives A and D where no consideration would be given to acquiring water rights. One stream segment on BLM-managed land is impaired due to dewatering: 0.06 miles of Pintlar Creek. Nineteen stream segments (about 32 miles of segments) on BLM-managed land are impaired due to flow alteration. Some of these stream segments would be restored by stabilizing flow rates through the control of water withdrawals.

Under Alternative B, requiring weed and erosion control practices in burned areas having documented sedimentation to surface water would benefit surface water resources more than in Alternatives A and D where no such provisions would be provided, but less than in Alternative C where any accelerated erosion in burned areas would be mitigated.

Only allowing new roads and facilities, for mining operations, inside Riparian Management Zones when no other alternative exist would provide additional water quality protection beyond that provided in Alternatives A and D, but less than in Alternative C where no roads or facilities would be permitted in RMZs.

Under Alternative B a No Surface Occupancy stipulation for oil and gas exploration would be in place on approximately 146,477 acres in the following municipal watersheds: Missouri River Siphon, Tenmile Creek Drainage, Big Hole River Intake, and Moulton Reservoir. Protection provided by this stipulation would likely be most critical on approximately 11,784 acres of land in the Missouri River Siphon that are located within one of the sub-areas identified in the RFD as being most likely to have oil and gas exploration/development activity. This stipulation does allow for exceptions or modifications if the lessee can demonstrate that operations can occur within municipal watersheds without causing negative impacts to water quality at the intakes, or if the authorized officer determines that portions of municipal watersheds can be leased without causing water quality at intakes to violate drinking water standards. This would be more protective of municipal water supplies than standard lease terms in Alternative A and the Controlled Surface Use stipulation in Alternative D, but less protective than the No Lease stipulation in Alternative C.

Effects of Alternative C

While all alternatives would meet, or strive to meet, state water quality standards, Alternative C would improve water quality from current conditions. In fact, it would produce better water quality than possible under all the other alternatives.

The treatment of up to 2,000 acres of grassland habitat; up to 750 acres of shrubland habitat; up to 4,800 acres of dry forest; and up to 550 acres of cool, moist forest per decade to restore vegetation communities could result in increased soil erosion and in some cases, localized and minor short term sediment impacts (as described above in Effects Common to All Alternatives). These impacts would be the least of any of the alternatives because Alternative C proposes the least amount of ground disturbance associated with vegetation treatments. However, this alternative would also generate the lowest level of long-term benefits (associated with restoring vegetative communities and associated ground cover and fuel loadings) than the other alternatives.

Like Alternative B, Alternative C proposes Riparian Management Zones (RMZs) where management emphasis would be on maintaining and restoring riparian resources. Since the RMZ widths in Alternative C would be greater than those in Alternative B, Alternative C would provide the greatest level of protection from land management activities.

To achieve the maintenance and restoration of riparian function, the mechanical treatment of up to 200 acres of riparian areas may occur per decade. This might create minor short-term sediment impacts as noted under Effects Common to All Alternatives. These effects would be greater than with Alternative A (30 acres), but less than with Alternatives B and D (up to 700 acres and up to 1,700 acres per decade, respectively). However, improving the function of riparian areas would produce several long-term benefits to water quality.

Alternative C is the only alternative where timber harvest would not be allowed in riparian areas. This would provide the most water quality protection from harvest related sediment and other pollutants. However, this could make it more difficult to manage these areas for specific characteristics potentially increasing long-term risk (i.e. reduce fuel loadings).

Overall, this alternative would produce the lowest level of grazing related impacts to water quality (and an improvement from current conditions). This is because the McMasters Hills and Spokane Hills allotments would be managed as forage reserves rather than as general grazing areas. In addition, the Indian Creek, Dog Paw, Sixmile Park County allotments would not be available for grazing. These three allotments would be available as either forage or general permits under Alternative B and available for general permits under alternatives A and D. In addition, the total amount of lands available for grazing (262,000 acres) would also be lower than under any other alternative (Alternative B = 265,000 acres; Alternatives A and D = 273,000 acres).

Under Alternative C no aerial applications of herbicide to treat noxious weeds would occur. This is more protective of water quality than any other alternative where aerial applications would occur with various "no-spray" riparian buffers in Alternatives B and D and no "no-spray" riparian buffer in Alternative A.

Alternative C would close or decommission approximately 425 miles of routes currently open to use by motorized vehicles. This reduction in ground disturbance associated with motorized routes would reduce impacts to water quality (primarily sediment) more than with any other alternative as these routes re-establish vegetation. . This reduction in ground disturbance would reduce soil erosion and should provide a moderate to high long-term benefit to water quality (compared to current conditions).

Alternative C would provide the most acres of low density roads (141,264 acres with less than 1 mi/mi^2 road density) compared to all other alternatives. This represents 25,000 more acres than currently exists. Alternative C would also produce the fewest acres with high road densities (road density greater than 2 mi/mi^2) of all alternatives (26,000 fewer acres than current conditions). Of the action alternatives, Alternative C would produce 6,500 fewer acres of high road density compared to Alternative B and 14,300 less than Alternative D. Having the lowest road density would suggest that there is less chance for roads to impact streams. This would indicate a lower risk to water quality than the other alternatives.

Under Alternative C, approximately 73.7 miles of motorized routes within 300 feet of streams would remain open to motorized use Decision Area-wide. This is less than with any alternative and would represent a reduction of 21.6 miles from current conditions. Therefore, Alternative C would pose the lowest impact to water quality associated with roads in and near riparian areas of all alternatives.

In the context of road design and maintenance, Alternative C would be the most protective of water quality of all alternatives. In addition to measures taken in Alternatives B and D, Alternative C also calls for stream crossings to accommodate 100-year storm events (compared to the BLM standard of 25-year storm events in the other alternatives). This would reduce the risk of culvert failure and associated channel impacts (scour and deposition).

In the context of Wild and Scenic Rivers, Alternatives C and A would provide the greatest level of water quality protection of all the alternatives. All four segments (12 miles) would be recommended as suitable for WSR designation in Alternative C. Water quality would likely be more protected in all four of these segments compared to Alternative B where only two segments would be recommended as suitable, and Alternative D where no segments would be recommended as suitable.

Alternative C proposes the designation of the Spokane Creek ACEC (14 acres). The entire potential ACEC is essentially a riparian area. Proposed ACEC management would increase protection of water quality in this area by not allowing new road construction, closing the area to new rights-of-way and R&PP leases, and providing for No Surface Occupancy for oil and gas exploration. These measures would not be in place under any other alternative because this potential ACEC is not proposed in those alternatives.

Under Alternative C, benefits associated with considering the acquisition of water rights from willing sellers would be the same as in Alternative B.

Requiring weed and erosion control practices in all burned areas having any accelerated erosion would benefit surface water resources more than with any other alternative. This is because Alternatives A and D have no requirements for this at all and Alternative B provides for this measure only when sedimentation effects are definitively taking place.

Under Alternative C BLM would commit to reducing pollutants in streams to target levels indicated in Water Quality Restoration Plans. This would benefit water quality more than with any other alternative because no

such commitment is made under Alternatives A or D; and under Alternative B meeting targets would be considered, but not necessarily committed to.

Prohibiting new mineral operation roads and facilities inside Riparian Management Zones would provide additional water quality protection (potentially to the extent of removing some stream segments from the impaired list). Alternative C would provide more water quality protection associated with mining operations than Alternatives A, B or D.

Alternative C includes the proposed withdrawal from mineral entry of approximately 180 acres of riparian areas in the Muskrat Creek drainage and would therefore provide greater water quality protection in that area associated with mining than any other alternative.

Under Alternative C the No Lease stipulation for oil and gas exploration would be in place on approximately 146,477 acres in the following municipal watersheds: Missouri River Siphon, Tenmile Creek Drainage, Big Hole River Intake, and Moulton Reservoir. This would essentially eliminate the possibility of impacts to water quality in municipal watersheds associated the oil and gas exploration and development.

Effects of Alternative D

While all alternatives would meet, or strive to meet, state water quality standards, Alternative D would produce the least improvements to water quality than the other action alternatives. However, it would provide a slight improvement over what would occur under current management (Alternative A).

Treatment of up to 19,100 acres of grassland habitat; up to 6,800 acres of shrubland habitat; up to 18,200 acres of dry forest; and up to 5,050 acres of cool, moist forest per decade to restore vegetation communities could result in increased soil erosion and in some cases, localized and minor short term sediment impacts (as described above in Effects Common to All Alternatives). These impacts would be the greatest of all alternatives because Alternative D proposes the greatest amount of vegetation treatments. However, this alternative would also generate the greatest level of long-term benefits (associated with restoring vegetative communities and associated ground cover and fuel loadings) than the other alternatives.

Treatment of up to 1,700 acres of riparian areas per decade to restore riparian vegetation communities may occur. This might create minor short-term sediment impacts (as noted under Effects Common to All Alternatives). If at the project scale an approach that focuses on achieving site-specific riparian ecological objectives is used, this could create the potential for the greatest long-term benefits to water quality associated with improved riparian vegetative conditions of all alternatives. In many cases, treating riparian areas to meet a broad range of site-specific ecological objectives would likely lead to leaving greater quantities of trees, snags, and down wood than if they are managed under the SMZ law. However, the riparian management prescribed under Alternative D would be SMZs as per the SMZ law. Allowing timber harvest in streamside management zones (within the up to 1,700 acres described above) would have similar effects as those described under Alternative A. If that management is conducted based on the SMZ law, Alternative D would be less protective of water quality associated with riparian timber harvest than either Alternatives B or C.

Effects to water quality associated with livestock grazing would be the same under Alternative D as those described for Alternative A.

Under Alternative D aerial spraying of herbicides to treat noxious weeds would not occur within 200 feet of streams or wetlands. This would be more protective of water quality than Alternatives A and B, but less than Alternative C.

Alternative D would close or decommission approximately 310 miles of routes currently used by motorized vehicles. This reduction in ground disturbance would reduce soil erosion and should provide a moderate to high long-term benefit to water quality (compared to current conditions). However, the improvement would be less than under Alternatives B and C.

Under Alternative D, approximately 81.2 miles of motorized routes within 300 feet of streams would remain open to motorized use Decision Area-wide. This is 13.1 miles less than currently exist but would leave more miles than under Alternatives B and C. As a result, Alternative D would pose the second greatest threat to water quality related to roads in and near riparian areas of all alternatives (but it would still represent an improvement over current conditions).

Alternative D would provide more areas with low road densities (less than 1 mi/mi^2 road density) than currently exists (123,073 acres versus 116,236 acres with Alternative A). However, it would have the least among the action alternatives. It would also provide a reduction in the amount of area with high road density (greater than 2 mi/mi^2 road density) from current conditions (95,481 acres versus 107,560 acres for Alternative A). However, this would be the lowest reduction among the action alternatives. These road densities suggest that this alternative would pose a reduced risk (to water quality) from current conditions, but the highest among the action alternatives.

In the context of road design and maintenance, Alternative D would be slightly less protective of water quality and streams than Alternative B, more protective than Alternative A, but less protective than Alternative C where stream crossings would be designed to accommodate 100-year storm events.

Alternative D would recommend no potential Wild and Scenic Rivers as suitable for WSR designation. There

would be no potential benefits to water quality in any of the four eligible river segments. This constitutes the least potential benefit to water quality of any of the alternatives.

Allowing new roads and facilities, associated with mining operations, to be built in riparian areas would impact water quality similarly to Alternative A and would be less protective than Alternative C.

Under Alternative D a Controlled Surface Use stipulation for oil and gas exploration would be in place on approximately 146,477 acres in the following municipal watersheds: Missouri River Siphon, Tenmile Creek Drainage, Big Hole River Intake, and Moulton Reservoir. This stipulation would allow for relocation of proposed roads, drilling sites, and other facilities, or application of appropriate mitigating measures to protect drinking water. This would be more protective of municipal water supplies than standard lease terms in Alternative A but less protective than the No Surface Occupancy stipulation in Alternative B or the No Lease stipulation in Alternative C.

VEGETATIVE COMMUNITIES

Effects Common to All Alternatives

General Vegetation

Proposed management of the following resources/resource uses/programs would have no anticipated impacts to vegetation: Geology, Paleontology, Back Country Byways, National Trails, Wild and Scenic Rivers, Environmental Justice, Hazardous Materials, Indian Trust Resources and Tribal Treaty Rights.

Seasonal restrictions, project access, development, and vegetative resources management activities are designed to reduce the amount of mineral soil exposure and length of time that the soils are exposed. In 2004, the use of Forestry Best Management Practices was demonstrated to be 96 percent effective in adequately limiting non-point source pollution in the 354 practices rated on federal lands (Montana DNRC, 2004). These practices would support soil fertility and productivity and would help maintain healthy and diverse vegetation.

Special Status Species Management could restrict the timing of some restoration activities, especially spring burning. Most timing restrictions occur during winter and breeding seasons. For example wolf den sites would be avoided during the denning period while raptor nests would be avoided during the breeding season. These restrictions could make implementation more difficult, but would not prevent restoration of vegetative communities.

Fire Management Unit (FMU) Designations affect vegetation variably by determining what application (tool) is allowed to treat vegetation and what the suppression response will be.

In FMU designation A, wildland and prescribed fire is not desired. Fire management emphasis would be placed on prevention, detection, rapid response, use of appropriate suppression techniques and tools, and non-fire fuels treatments. The effects on vegetation with non-fire fuels treatments would possibly be more ground disturbance, less nutrient cycling and less overall reduction in the fuel loadings due to no fire application. The suppression response may also lead to more ground disturbance due to the fact that wildland fire is not desired.

In FMU designation B wildland and prescribed fire are likely to cause negative effects, but these effects can be minimized or avoided through fuels management. The effects on vegetation would be similar to FMU A, except prescribed fire would be an alternative tool to use if appropriate; this would allow for more nutrient cycling and more fuel load reductions. Ground disturbance would be similar to FMU A, because the emphasis would still lean toward mechanical based treatment in this FMU designation. Suppression response would also be similar to FMU A but would allow more flexibility which may limit ground disturbance.

In FMU designation C natural, wildland fire use for resource benefit and prescribed fire is desired to manage ecosystem but constraints need to be considered. The effect on vegetation would be similar to FMU B except prescribed fire is desired and would be used in wider application compared to FMU B. Ground disturbance may be less and nutrient cycling and overall fuels load reduction would be greater with prescribed fire application. These areas would receive lower suppression priority in multiple wildland fire situations and would allow more flexibility which may limit ground disturbance.

In FMU designation D, natural wildland fire use for resource benefit and prescribed fire is desired to manage ecosystems with no constraints. The effect on vegetation would be similar to FMU C except wildland fire use for resource benefit is desired and would be used in wider application. Ground disturbance may be lessened and nutrient cycling and overall fuel load reduction would be greater with prescribed fire application. These areas would receive lowest suppression priority in multiple wildland fire situations and would allow more treatment flexibility which could limit ground disturbance.

Air quality restrictions from the Montana/Idaho Airshed Group and Montana DEQ could have a moderate but localized impact on restoration treatments that include prescribed burning by limiting the amount of burning that could take place at certain times or under certain air quality conditions.

Some cultural resource sites could be encountered and could have negligible effects on vegetative restoration activities by the designation of avoidance areas or possible restriction on implementation tools.

Development of new recreation sites would directly remove vegetation from sites where facilities are con-

structed and lead to altered vegetation near recreation sites from activities such as trampling, collecting fire wood, and picking wild flowers.

Use of new and developing technologies and industries would help achieve healthy forest and biomass utilization goals by broadening and varying the tools available for treatment and increasing the number of collaborative partners. These improvements would reduce the economic and budgetary constraints, and the number of declining vegetative situations that can be feasibly treated would be increased. These would provide for more positive impacts and improve the results of the treatments.

Grassland and Shrublands

Prescribed fire, timber harvest and other mechanical treatments would reduce conifer encroachment in grasslands and shrublands, helping to establish pre-fire suppression conditions. Grasses, forbs, and shrubs would increase in density and vigor with removal of conifers. Treatments would reduce the canopy coverage, potential conifer foliage impacts on soils (acidification and changes in soil microorganisms), and the direct competition of conifers with native grasses, forbs, and shrubs, setting back succession to a more open, seral condition.

The use of low intensity fires in broadcast burning should move these vegetative communities back toward historic conditions. Prescribed fire would consume above-ground biomass but would not cause mortality to most perennial herbaceous species. Fires would move relatively quickly through grasslands and shrublands and soil temperatures would not be sufficiently high to kill roots and growing points of most grasses and forbs. Most perennial herbaceous species would generally respond within one year with vigorous regrowth. Most annual species of grasses and forbs would reproduce from seeds following prescribed fire.

Relatively high rates of mortality would occur to seedlings and saplings of conifers and some species of shrubs that do not sprout from root crowns (e.g., big sagebrush and bitterbrush). Impacts to these shrub species could persist in the mid to long-term. Other species of shrubs sprout from root crowns following fire so there could be a shift in composition to higher percentages of shrubs that regenerate from root sprouts.

Mechanical treatments (no fire) would be used in most cases to remove conifer encroachment in shrubland communities and would have negligible mortality of desired shrub species associated with them. In these areas where fire is used as a treatment, some loss of desired species, such as sagebrush and bitterbrush, is expected. Use of low intensity fire and/or combination of low intensity fire and mechanical treatments to allow for a mosaic burn in these areas would minimize mortality of desired species. These treatments would have long-term benefits to shrublands due to elimination of competition from conifers.

Conifer removal treatments would create a mosaic of multiple successional stages; reducing the dominance of woody vegetation in grassland and shrubland communities and releasing suppressed, desired plants.

Treatments within sagebrush communities would emphasize improving or maintaining habitats for sage grouse and other sagebrush dependant species by removing conifer encroachment, creating a mosaic of grassland and sagebrush habitats, and regenerating decadent sagebrush. Project level objectives would be to prevent a decline in the quality and quantity of sagebrush communities.

Livestock grazing would stimulate biomass production for some grass species and most shrubs, and reduce production of other species (mostly forbs) that are sensitive to grazing. Plant species diversity may be reduced in localized areas near water sources or salt grounds where animals congregate. Species with low palatability, including most noxious weeds and some invasive species would increase in density on some sites, particularly those with severe ground cover loss or in bunchgrass communities.

By reducing biomass production, grazing could reduce the frequency and intensity of wildland fire by reducing fine fuels, which would favor encroachment of conifers into grasslands and shrublands. Livestock grazing would recycle plant nutrients through ingestion and deposition of waste.

Implementation of livestock grazing guidelines to promote vegetative recovery and maintenance would minimize these impacts and could result in a net improvement to the health of grasslands, sagebrush communities, and shrublands where grazing has caused degradation. Prescriptive grazing could be used as a management tool to achieve specific habitat objectives such as the reduction of noxious weeds.

Treatments to reduce noxious weeds in grasslands and shrublands could have short-term localized mortality of native plants (primarily forbs) associated with them but would benefit these areas overall by reducing or eliminating competition from noxious weeds and allowing native plants to dominate. The amount affected would vary with herbicide application method. Aerial application would be used on large areas of heavy weed infestations. Ground broadcast would be used on smaller areas of heavy infestations. Hand spot application would be the most common application method and would have little effect on other vegetation as the application would be target specific to the individual weed plants.

Roads through grassland and shrubland habitats would continue to preclude re-establishment of grassland and shrubland vegetative species within their footprints. Roads would also continue to facilitate introduction and spread of noxious weeds.

Leasing solid minerals would lead to disturbances and removal of vegetation during exploration and development. Reclaimed land could have reduced plant species diversity potentially for decades following mining.

Reclamation of abandoned mine lands would increase vegetation cover, productivity, and diversity in the long-term.

Sleeping Giant ACEC management restricting livestock grazing along the river shoreline north of Homestead Pasture from Memorial Day weekend through Labor Day would improve vegetation health and vigor.

Forests and Woodlands

Due to long-term fire suppression, forests and woodlands have become dense with fuel quantities increasing such that wildland fires often are more intense and severe than under historic fire regimes (Keane *et al.* 2002). In some cases this results in widespread stand replacement. This stand replacement could result in vegetation type conversion, severe erosion or the need for extensive restoration efforts, including tree planting.

Silvicultural treatments including harvest, thinning, other mechanical treatments, and prescribed fire would reduce conifer stocking in many areas and could create openings of various sizes to stimulate development of young stands. This is expected to enhance or maintain healthy vegetative structure; density; and species composition, pattern, and distribution; which would promote forest productivity and reduce the occurrence of forest disease and insect outbreaks. In addition, the severity of vegetative impacts resulting from wildfire events would be reduced.

Harvesting of Christmas trees, firewood, and other public demand forest products would generally take place near open roads, due to effort needed to first locate, cut down, and then physically remove the purchased product to the transporting vehicle. Removal of Christmas trees would reduce the density of conifer saplings by a small amount in some locations, although this is considered to be negligible as very few naturally grown saplings are considered to have acceptable Christmas tree qualities such as good crown conformation, color, and shape. Post and pole harvesting and removal of other woody materials would also contribute to thinning smaller trees and allowing larger diameter trees to dominate in the overstory canopy. While the removal of these and other types of forest products such as Christmas boughs, wildling transplants, and specialty furniture stock, may be obvious within a specific location, the amounts removed would generally be small, typically loaded in a pick-up truck, and the area affected would usually be less than 2 acres, with the cutting and removal being selective in nature.

Regeneration harvesting (i.e., clearcutting, seed tree harvest, and shelterwood harvesting) would tend to create openings for new forest regeneration often with tree removals at levels similar to tree mortality observed in stand replacement burning. Thinning and selection treatments including mechanical treatment, and understory burning would reduce the density of seedling, pole, and medium-sized (9 to 15 inch DBH) trees resulting in a more open overstory canopy of larger trees.

Some larger trees would be removed in regeneration harvesting, group selection removal, insect control, and access requirements. Also, some large trees would be killed with burning prescriptions. This could increase snag density per acre and the amount of down woody material. Forests would be more open with a larger proportion of larger-diameter trees.

Removal of groups or stands of trees would result in seral vegetative conditions, similar to those found in newly establishing forest. Conifer seedlings regenerated naturally or artificially, would establish under open conditions that also stimulate the grasses or shrubs, until the developing tree canopies close, and trees dominate the treatment area (about 15 to 30 years). Such openings tend to favor pine species in mixed conifer types, while shelterwood and selective treatment methods favor regeneration of Douglas-fir, and subalpine fir at higher elevations.

Post and pole harvesting and removal of other woody materials would also contribute to thinning smaller trees, which would reduce wildland fire intensity and allow larger diameter trees to dominate the overstory canopy. This acreage, however, is negligible.

Based on 2004 insect surveys, approximately 15 percent of all mature forest types may be involved with some type of silvicultural treatment or insect control. Treatments to reduce the risk of epidemic levels of forest insects or disease would result in removal of affected trees or trees at risk for sustaining insect or disease epidemics. Treatments would create and promote forest stand structure and composition that is resilient to epidemic outbreaks, and may periodically require regeneration of new stands to reduce risks or infestations of pests such as mountain pine beetle or dwarf mistletoe. Resilient forests can be characterized by more open stands with more diversity in both structure and composition.

Insect control in post-wildland fire environments would be considered and/or implemented during emergency site stabilization and restoration activities, protecting large trees that are susceptible to infestation and mortality. This is expected to increase the rate of natural forest regeneration by retention of important live seed sources for the conifer species. Only Wilderness Study Areas would be excluded from insect control through infested tree removal or salvage techniques by BLM policy.

Where serious infestations already exist, direct suppression would regenerate a new stand or stand component in the opening created by the mortality and/or salvage.

Timber salvage operations would usually result from wildfires or insect infestations, and could consist of a variety of harvest methods including even-aged management. Salvage operations would reduce fuel loading and allow regeneration of lodgepole pine and Douglas-fir. Conversely, salvage operations in the spring may reduce soil productivity by compacting moist soils, which could result in lower regeneration establishment and slower growth. This effect would rarely occur because timber removal and heavy equipment work on Decision Area lands has generally been limited to conditions when the soils are frozen or dry. This restriction is a variation on Best Management Practices (BMP) designed to protect soil productivity and reduce soil loss, and it has been universally applied to all BLM salvage operations and any other timber harvesting work conducted in the Decision Area in the past.

Fuels reduction in the wildland urban interface would result in the removal of trees and shrubs to reduce the hazards associated with high intensity and severity wildland fires. Fuels reduction would decrease the density of seedlings and saplings and ladder fuels (lower tree branches) and would result in a more open forest dominated by larger-diameter trees.

On-site dispersal of woody material created by mechanical reduction or other management actions would contribute to cycling of nutrients and organic matter and provide nutrients for fungi, bacteria, invertebrates and other organisms that are an integral part of forest ecosystems.

Wildland fire suppression would affect vegetation by preventing fires that: reduce fuel loading; decrease tree density; and regenerate lodgepole pine and aspen stands. However, suppression also prevents severe soil scorch and other detrimental effects associated with high-severity wildland fires.

VRM Classes I and II would limit some types of restoration tools available, such as creating large openings in the forest canopy. Impacts would be negligible with the majority of restrictions affecting the Big Hole River corridor, where visual quality is an important resource. Such prescriptions could be modified to smaller openings, group selections, or other means of partial cutting.

The designation of ACECs would have minor impacts to forest and woodlands. Management to protect relevant and important values could place restrictions in some ACECs that would prevent certain types of vegetative treatments.

Placement of new permanent roads for access would reduce the amount of healthy forest land by approximately 2½ to 3 acres per mile of road, as the forest vegetation would not be able to regenerate in those locations. However, the use of temporary roads for access would retain forest productivity in those locations after abandonment and rehabilitation.

Dry Forest

Dry forest treatments would help restore the historic structure and composition of dry Douglas-fir, ponderosa pine, and limber pine forests. Treatments would reduce conifer stocking and stimulate ground vegetation, thereby restoring conditions consistent with pre-fire suppression conditions. Treated Douglas-fir forests will be more resilient to western spruce budworm, as susceptible dense, multi-storied canopies are thinned (Joy and Hutton, 1990).

While most of the treated dry forest stands are expected to have over-story canopies remaining with substantial amounts of large and medium sized trees, forest and woodland manipulations may also include methods designed to regenerate areas of new forest. Individual projects themselves may vary greatly in the percentage of area where silvicultural practices and treatment techniques that promote regeneration are utilized, as these depend on the scope of the individual projects, the treatment objectives, and forest conditions. Regeneration of new stands or groups of trees with early seral forest and woodland characteristics would likely occur on approximately 20 percent of dry forest lands treated for restoration. The remaining dry forest stands would have sufficient levels of healthy forest canopy to moderate natural regeneration, particularly for the pine conifer species.

Tree planting could also be used as a technique to increase the percentage of regeneration cutting treatments, by assuring adequate re-establishment of young forest on sites where natural regeneration would normally be very slow to return in these forest types.

Continued fire suppression would extinguish and/or prevent fires that would vary in intensity and severity. Suppression of fires in dry forest types could prevent less-intense fires that would reduce fuels and the density of seedling, saplings, and pole-sized trees. Stands that continue to miss fire cycles will become more susceptible to defoliation from western spruce budworm and infestation by the Douglas-fir beetle, increasing the likelihood of mortality (DeNitto, 2007).

Cool Moist Forest

Cool moist forest treatments would reduce tree stem densities and create openings and early seral forest conditions, mimicking pre-fire suppression conditions. Lodgepole pine would be regenerated by removal of decadent overstory trees, allowing seedlings to become established.

Creation of a mosaic of lodgepole pine stands of differing sizes and densities will reduce the risk of an epidemic mountain pine beetle outbreak on BLM lands. Where treatments occur in lodgepole pine forest, infestation levels of mountain pine beetle may be reduced. Effectiveness of treatment will depend on the current level of infestation, but removing trees before the beetles are

able to reproduce and infest other trees can reduce the level of impact in adjacent lodgepole pine stands. Although treatments may affect localized stands or areas from mountain pine beetle, overall treatments will not have an impact on epidemic mountain pine beetle outbreak the DA is currently undergoing.

The Lynx Conservation Assessment and Strategy (LCAS) provide direction on the types of activities and the amount of habitat that can be modified in lynx habitat. Because lynx habitat is identified as cool, moist forests of lodgepole pine, spruce or Douglas-fir, treatments in these habitat types could be restricted. Thinning high density medium to large size trees would be the least restricted treatment in lynx habitat as long as suitable habitat is maintained. The thinning of small-diameter trees would be the most restricted type of activity. Small-diameter thinning treatments in lodgepole pine stands would be heavily restricted in order to retain forage habitat for lynx. This could slow growth and productivity, lengthening the amount of time needed to grow large diameter pine trees in these stands. The size and location of openings created through forest management could be restricted but openings may be considered beneficial if forage habitat for lynx is limited.

Riparian Types

Managing riparian areas with an emphasis on maintaining and restoring riparian function would allow forest vegetation to develop in response to disturbance regimes associated with fire and flooding, particularly riparian areas that are functioning at risk, because they would be high priority for restoration.

Implementing livestock grazing guidelines to meet Land Health Standards would treat and improve riparian areas by maintaining or improving vegetative cover and structure to trap and hold sediment to rebuild streambanks, restore/recharge aquifers, and dissipate flood energy. Deep rooted herbaceous and woody shrub species would be promoted to stabilize streambanks and reduce soil erosion.

Projects to restore riparian areas and wetlands would result in a dominance of broad-leaf trees and shrubs forming an overstory canopy in appropriate locations. With increased diversity and vigor of streamside plant communities, functional condition ratings for streams would improve. Forested riparian habitat would be managed to accelerate the development of mature forest in suitable types, while in other areas such as dry or lodgepole dominated forest types, management would emphasize the maturation of broad-leaved species.

Livestock grazing in riparian areas could reduce the extent of vegetative ground cover and vegetative species diversity. In locations of locally severe native vegetation loss, noxious weed infestations could occur. All of these effects could occur to variable extents across the Decision Area. Health and integrity of riparian vegetation would be protected and improved by livestock fencing, development of upland water sources, and timing livestock use to avoid sensitive periods or to reduce the intensity of grazing and trampling.

Roads and trails occupying riparian areas would preclude development of riparian vegetation. (In the alternative-specific analysis at the end of this chapter, mileages of motorized routes within 300 feet of streams are used as an indirect indicator of the extent of this impact by alternative.)

Management to benefit sage grouse would protect the integrity and diversity of vegetation in riparian habitats.

Mineral exploration and development activities would continue to have localized impacts to riparian vegetation. Effects could be short, mid, or long-term and could vary in scale substantially based on the nature and size of the activity.

Locating incident bases, helibases, and other incident management activities outside of riparian zones would prevent damage to riparian vegetation and allow maintenance or improvement of functioning condition.

Any ground disturbing activities in riparian areas would promote noxious weed infestations. Pre- and post-project weed monitoring and treatments would minimize effects in riparian areas

Wild and Scenic River (WSR) designations would lead to managing a ¼-mile corridor on either side of these segments to protect the Outstandingly Remarkable Values (ORVs). Potential future land use disturbances such as utility corridors, timber harvest, or mining within the corridor would be managed in such a fashion as to maintain or enhance the ORVs. The risk of disturbance to riparian vegetation would be reduced.

Noxious Weeds

Management of noxious weeds and other invasive species would not reduce the total number of weed infested acres within the Decision Area because treatments would not exceed the rate of expansion under any alternative. Natural expansion without treatments would occur at approximately 14 percent/year (USDI-BLM 1996). Alternative prescriptions would affect the locations and quantity of weed treatments, and weed populations would decline in vigor and extent on treated sites.

Coordination of weed management with federal, state, county, and private landowners and organizations would result in more effective and cost efficient weed control because treatments would address the natural boundaries of the infestations and management resources could be shared between partners. This would result in protecting more acres from new infestations and controlling more acres of existing weed infestations. Using Integrated Weed Management would also assist with weed control by focusing the multiple methods of weed management on the conditions which affect weed population size and outbreak of new infestations.

Increases in weed acreage within the Decision Area would result primarily from expansion of existing weed infestations supplemented by new infestations and possibly by acquiring weed infested lands. However, acquisition criteria states that BLM would avoid considering acquisition proposals with an abundance of noxious weeds when those management problems outweigh the expected benefits of the acquisition. New weed species, such as the salt cedar on Canyon Ferry and St.-John's-wort in Jefferson County, may also enter the Decision Area from adjacent infested areas.

Weed population size is dependent on three conditions, the relative amount of weed seed or root sources for reproduction, the availability of safe sites for germination and/or propagation, and having access to the necessary resources for plant growth which are sunlight, water, and nutrients. Management actions which reduce these conditions would decrease or control weed population size while actions which produce these conditions would usually increase weed population size.

Promoting healthy desired vegetation is the most common and long-term reducer of weed populations because the desired plants continually compete with weeds in producing seeds, occupying germination sites, and acquiring resources for growth. Vegetation restoration and fire rehabilitation activities, including revegetation and protection of post-fire plantings, would be effective methods for improving desired vegetation populations though vegetation treatments may initially cause weeds to increase because of associated ground disturbance.

Vegetation treatments which restore grasslands, shrublands, and riparian areas would be particularly effective in reducing potential weed spread because most noxious weeds and invasive species occur in these habitats. Using weed seed free forage and cleaning vehicles and equipment would decrease weed seed and root sources; thereby reducing the number of new infestations. Education and outreach would reduce weed establishment and spread because people often act once they are informed about the effects weeds have on ecosystem health and economics if they are also taught methods for weed management.

Ground disturbing activities would be the biggest increase of both new and existing weed infestations because they often bring in seeds on equipment and vehicles, create bare spots for seed germination, and reduce competition for resources by removing desired vegetation. Wildfire would be the most uncontrollable disturbance and would create the greatest amount of new infestations as demonstrated by the Bucksnort and Boulder Complex fires of 2000. Additionally, fire retardant and burning of natural fuels release compounds useful for plant growth, thereby benefiting colonizing plants, particularly weeds and invasive species, by providing a surplus of nutrients. Therefore, forest management designed to reduce unnaturally large and severe wildfires would reduce the potential for increased weed populations.

Motorized public travel and camping within 300 feet of existing roads, acquisition of easements and exchanges to improve access to public lands, and use of Special Recreation Management Areas could increase human use from hiking, camping, hunting, horseback riding, and driving for pleasure; thereby increasing both disturbance and the risk of igniting wildfires which could lead to expansions in weed populations.

Other management activities which cause surface disturbances would also increase the potential for new weed infestations though most activities incorporate methods to reduce introduction and expansion of noxious weed and invasive species infestations like minimizing new road construction in weed infested areas, reseeding disturbed and exposed soils where necessary, and locating new utility facilities in existing rights-of-way.

Surface disturbing activities include building fire lines, helitack sites, fire camps, and new roads, use of existing roads and transportation facility sites, vegetation treatments, mineral and energy development, continued development and maintenance of public access routes, and land use authorizations which increase traffic and disturbance such as right-of-ways. Of these, potential increases due to roads and vegetation treatments are the most quantifiable and account for the variation among alternatives for potential weed spread estimates. Road closures, road decommissioning, and restrictions on mechanized equipment in Wilderness Study Areas reduce disturbance, so they would reduce weed expansion. Road decommissioning also usually promotes healthy desired vegetation through revegetation. However, if road decommissioning removes ready access to weed populations, treatment costs would increase and fewer acres may be treated.

Restrictions on aerial weed treatments may have similar effects of protecting desired vegetation while increasing weed treatment costs which might result in a decrease of total treatment acres. This is because weed treatments within an aerial herbicide application buffer would have to be ground treatments which can often cost up to 5 times more than aerial treatments.

The degree to which weed and invasive species populations impact their environments depends on the cumulative effect of infestations on the resiliency and sustainability of the desired plant community. Infestations which are a non-dominant part of a diverse, otherwise healthy desired plant community which controls the size and density of the infestations would have a low impact. Infestations would have a high impact when they dominate the plant community and are substantially reducing its sustainability and resiliency by negatively affecting the water cycle, erosion potential, nutrient cycling, and forage availability for wildlife and livestock. Infestations which affect some or all of these things but do not yet

substantially reduce the community's sustainability or resiliency would have a medium, or moderate, impact.

Effects of Alternative A

General Vegetation

Conversions of non-native to native vegetation would be limited to noxious weed control efforts and native plant seedings on ground disturbance projects. Larger, self-perpetuating stands of non-native agronomic grasses (e.g., smooth brome, timothy, Kentucky bluegrass, orchard grass, and crested wheatgrass) would persist, usually in areas that have been cultivated. Persistent stands of agronomic grasses would be resistant to the colonization by native species.

Revegetation seed mixes would generally consist of native species of wheatgrass, fescue, bluegrass, and blue flax. These cool-season species would germinate and initiate growth in early spring and establish stands that stabilize and protect the soil, and compete with noxious weeds and other invasive species. These seeded native species are generally similar to the dominant native species occupying foothill and dryer sites. Occasionally, revegetation seedings may not establish appropriate native species for some microsites.

On burned areas and other sites with a high potential for erosion and noxious weed invasion, non-native species would sometimes be seeded to stabilize slopes and prevent proliferation of noxious weeds and other invasive species. Seeding of cereal crops such as triticale, barley, and rye would provide vegetation cover for one or two years, but these species would die out as seed production declines. These species would provide organic material and nutrients to the soil and can act as "nurse" crops to some native species.

On small areas with high potential for erosion or noxious weed invasion, seeding with perennial non-native species would occur. These seedings may produce persistent stands, which can inhibit colonization by native herbaceous species and conifers; however, vigorous stands of non-native grasses may inhibit colonization and expansion of noxious weeds, in addition to protecting soil resources.

Under Alternative A, most land in the Decision Area (258,200 acres, 85 percent) would be managed as Fire Management Unit designation C. The remainder of DA lands would be in FMU designation B (36,700 acres, 12 percent) and in FMU designation A (7,300 acres 3 percent). The effects of FMU A, B, and C designations are discussed under Effects Common to All Alternatives, General Vegetation.

Under Alternative A, no road density target would be set for areas in big game winter and calving ranges. Following the elk management guidelines in the Cooperative Elk-logging Study (Lyon, et al. 1982) in these areas would allow the existing road network to remain open for public use. Conversely, each of the action alternatives specifies road density targets to be managed for in these areas. Alternative A would provide the greatest flexibility for permanent road use and construction, aiding in vegetation treatment feasibility.

No restrictions would be placed on vegetation treatments near caves and abandoned mines with bat populations. Having no related action here provides more flexibility than under Alternatives B and C where clearing would be prohibited within set distances from these population areas.

No restrictions related to activities near raptor nests would occur under Alternative A. This provides the greatest flexibility for treating vegetation in areas where these nests exist of all alternatives.

Acquisition of public access easements to construct new access routes would remove vegetation on approximately 1.5 to 3 acres per mile of road constructed. Vegetation removed could be native, introduced, weedy, or otherwise, but most easements are expected to result in a general improvement of management efficiency and feasibility of vegetative treatments.

Under Alternative A, the least amount of acres would be managed as VRM Classes I and II. This alternative provides the most flexibility to alter visual resources to accomplish vegetative treatments.

Grasslands and Shrublands

Approximately 5,250 acres of grassland and shrubland (combined) in the Decision Area would be treated per decade with prescribed fire, mechanical treatments, and other methods to improve health and resiliency of these communities. No watersheds have been identified as priorities for treatment in Alternative A.

Currently, in the Decision Area there are approximately 86,065 acres of grasslands and shrublands as compared to approximately 135,722 acres historically. This decrease in grassland and shrubland is a result of conversion to conifer-dominated stands. Treatment of 5,250 acres per decade would reduce conifer encroachment on treated acres. Assuming conifer encroachment has occurred over the last century as a result of fire exclusion (and heavy historic grazing); the rate of conifer encroachment has been approximately 4,966 acres per decade in grasslands and 1,445 acres per decade in shrublands. The combined rate of conifer encroachment in grasslands and shrublands is approximately 6,411 acres per decade. Based on these assumptions and the proposed rate of treatment, there would be a net increase in encroachment in grassland and shrubland habitats of approximately 1,161 acres per decade under Alternative A.

Under Alternatives A and D, there would be no seasonal restriction on prescribed fire implementation, if the treatment area is in prescription. There could potentially be times where prescribed fire occurs in the summer

months, which may detrimentally affect desired vegetation. Ungerminated seeds that remain in the soil would usually not be affected by prescribed fire. However, most small trees and shrubs such as sagebrush, bitterbrush, and mountain mahogany would be killed or damaged by "hot" prescribed fire, while larger ponderosa pine and Douglas-fir would usually not be killed. With Alternatives B and C, prescribed burning would be restricted between May 1 and August 30. This restriction could reduce the potential for fires with high intensity and severity that would cause unacceptable levels of mortality to desired vegetation.

Overall, Alternatives A and D would have greater effects on grasslands and shrublands associated with livestock grazing (described under "Effects Common to All Alternatives" for Grasslands and Shrublands) than either Alternatives B or C. Livestock grazing would occur on approximately 273,000 acres of Decision Area lands in Alternatives A and D, 265,000 acres in Alternative B, and 262,000 acres in Alternative C. (A subset of these acreages are grasslands and shrublands). Managing livestock grazing in the McMasters Hills, Spokane Hills, and Indian Creek allotments as available for general grazing permits in Alternative A would impact grasslands and shrublands in these areas greater than in Alternatives B and C, but the same as in Alternative D. Alternatives A and D would allow for general grazing permits in eight allotments (Centennial Gulch, Free Coinage, Alder Creek, Charcoal Mountain Custodial, Dickie, Maiden Rock Custodial, Quinn Creek, and Wineglass Mountain) where grazing would not be allowed in either Alternatives B or C. Grasslands and shrublands in these areas would be impacted by livestock grazing under Alternatives A and D, but not under Alternatives B and C.

Forests and Woodlands

Firewood removal would take place near roads and reduce standing and fallen dead trees. Under Alternative A, no diameter limits would be prescribed, so more large-diameter snags may be removed under this alternative, possibly decreasing potential late forest structure in isolated areas.

Under Alternative A, salvage may proceed without prescriptive restrictions for the management of species dependant on dead and dying forests or species dependant on down woody materials. Salvage would continue to be subject to other restrictions, resource protections, or special management considerations, such as: Best Management Practices (BMPs), Streamside Management Zones (SMZs), Interim Management Policy for Wilderness Study Areas, and management guidance for ACECs, as required for forest management activities under Alternative A.

Prescriptions for big game security habitat would be the least restrictive to vegetation treatments under Alternative A than under all the other alternatives. The guidelines presented in the Montana Cooperative Elk-Logging Study (Lyon et al. 1982) would be considered on a case-by case basis. Following the Logging Study would provide more flexibility and therefore increased feasibility of vegetation treatments.

Alternative A would have no buffer requirements in forested areas surrounding unoccupied raptor nests. Lack of these restrictions would provide for the most flexibility in treatments of all alternatives in these areas.

Dry Forest

Currently, there are 68,624 acres of high density, ponderosa pine and Douglas-fir dominated by medium to large-sized trees as compared to 19,042 acres historically. Approximately 3,600 acres (5 percent) of medium to large, high-density stands of ponderosa pine and dry Douglas-fir forest in the Decision Area would be treated per decade.

Treatments would reduce the density of small trees and allow larger trees to develop a more open structure with a larger component of understory grasses, forbs, and shrubs. Additional effects would be as described under "Effects Common to All Alternatives" for Forests and Woodlands

The proposed level of treatment under Alternative A may not be adequate to keep pace with the rate at which conifer density is increasing. Assuming conifer density has increased as a result of fire exclusion and past grazing practices over the past century on approximately 49,582 acres (the difference between historic and current acres of high stem density dry forest); the rate at which increased density has developed is approximately 4,958 acres per decade. Proposed treatments of 3,600 acres per decade would not keep pace with the rate of increased conifer density development in large and medium size class stands of ponderosa pine and Douglas-fir. With Douglas-fir encroachment increasing, western spruce budworm will likely increase as more host trees become available.

Prescribed burning and mechanical treatments in forest and woodland areas, taken together, could not exceed an average of 750 acres per year under Alternative A. This limitation may restrict the amount of forest and woodland treated per decade, so that areas having limited access or with lower priority for treatment may not be treated under this alternative.

Treatments on 500 acres of medium and large size class, low density, ponderosa pine and Douglas-fir would be implemented per decade to maintain the open character of the stands. Currently, medium and large size class, low density, ponderosa pine and Douglas-fir stands occupy 32,559 acres in the Decision Area as compared with 11,358 acres historically. As a result of fire suppression over the last century, tree densities have increased in these stands. Treating 500 acres per decade

would have a negligible effect on restoring these forest stands to historic conditions.

Additionally, 1,000 acres of dry forest would be thinned pre-commercially per decade, which would remove many smaller seedlings, saplings; and pole-sized trees, allowing larger trees to develop a dominant overstory. Up to 500 acres of treatments per decade would also be implemented to preserve the character and ecological functions of mature and old-growth stands. No watersheds have been identified as priorities for treatment. The 1,000 acres of pre-commercial thinning would have a negligible effect on restoring forests to historic conditions.

Cool, Moist Forest

Approximately 2,350 acres (17 percent of Decision Area total acreage in this type) of high-density stands of moist Douglas-fir, lodgepole pine, subalpine fir, and Engelmann spruce forest with medium to large-sized trees would be treated in the Decision Area per decade. Regeneration harvesting techniques such as seed tree harvesting, shelterwood cuts, and clearcutting may be applied to regenerate approximately 1,440 acres of cool moist forest and lodgepole pine stands per decade. Additionally, 50 acres of cool, moist forest stands would be thinned pre-commercially, which would remove smaller seedlings, saplings, and pole-sized trees, reducing the risk of intense wildland fire and allowing larger trees to develop a dominant overstory. No watersheds have been identified as priorities for treatment.

Currently, there are 13,764 acres of cool, moist forests composed of medium and large size class, high density stands in the Decision Area as compared to 8,422 acres historically. Assuming high density stands developed over the past century in response to fire suppression and livestock grazing, the rate of increase would be 534 acres per decade. The proposed level of treatment (2,350 acres) would reduce the acres of high density stands to 11,948 acres during the first decade of treatment.

Alternative A would result in the restoration of 2,400 acres per decade of cool, moist, high-density forest communities with a net gain of approximately 1,816 acres restored per decade of areas dominated by medium to large-sized trees.

Riparian Types

The Streamside Management Zone Law provides the minimum regulatory standards for forest practices meeting the timber sale definition in Streamside Management Zones (SMZs). The SMZs provide protection to water quality, streambank stability, down woody material and shade by restricting certain forest activities such as clearcutting, operation of wheeled or tracked equipment except on established roads, construction of roads, deposition of slash, and broadcast burning. Streamside Management Zones, however, would provide limited protection to overall riparian function and habitat diversity for terrestrial species. By focusing dead and live tree retention within the first 50 feet upslope of stream margins, and by allowing smaller diameter trees to be retained (down to 8 inches DBH), SMZs could limit: size and quantity of wood recruited to streams and floodplains; trees and snags that could serve as foraging, nesting, hiding, and brood rearing habitat for many wildlife species; and quality of wildlife movement corridors.

Streamside Management Zones are 50 feet on either side of a stream on slopes less than 35 percent hillslope gradient, and 100 feet on either side of a stream with sideslopes greater than 35 percent. Under Alternatives A and D approximately 3,528 acres of riparian habitat would have restrictions on management activities in SMZs ( ).

Up to 30 acres (1.3 percent) per decade of riparian vegetation would be treated by mechanical means or prescribed fire, with non-functional riparian areas or areas functioning-at-risk (approximately 55 percent of Decision Area total) receiving priority for treatment. Treatment of 30 acres of riparian vegetation per decade would tend to move lower functioning condition areas toward a higher functioning condition. At this rate of treatment, it would take many decades to bring all riparian areas into proper functioning condition; however, other factors such as grazing management and improved road management practices could also improve the functional status of riparian areas.

Maintaining livestock exclosures in riparian areas would protect vegetation from grazing and trampling damage.

Overall, Alternatives A and D would have slightly greater impacts to riparian vegetation associated with livestock grazing (described above under "Effects Common to All Alternatives" for Riparian Types) than either Alternatives B or C. Livestock grazing would occur on approximately 273,000 acres in Alternatives A and D, 265,000 acres in Alternative B, and 262,000 acres in Alternative C. Managing livestock grazing in the McMasters Hills, Spokane Hills, and Indian Creek allotments as available for general grazing permits in Alternative A would potentially impact riparian vegetation greater than in Alternatives B and C, but the same as in Alternative D. Alternative A allows for general grazing permits in eight allotments (Centennial Gulch, Free Coinage, Alder Creek, Charcoal Mountain Custodial, Dickie, Maiden Rock Custodial, Quinn Creek, and Wineglass Mountain) where grazing would not be allowed in either Alternatives B or C.

Roads and trails currently impact riparian areas in a number of ways. Roads and trails are usually devoid of vegetation which causes accelerated erosion and sediment delivery to riparian vegetation and streams. Additionally, trails in the riparian zone can compromise the riparian vegetation's ability to act as a sediment filter. Also roads and trails are active conduits for noxious weeds and invasive species to infest riparian areas. Under Alternative A, Decision Area-wide, approximately

Table 4-1
Acres of Forested and Non-Forested Areas in SMZs or RMZs by Watershed and Alternative

Watershed	Alternative		
	SMZ A & D	RMZ B	RMZ C
Big Hole – Forested	519	1,031	1,856
Big Hole – Nonforested	409	409	1,048
Blackfoot – Forested	11	34	66
Blackfoot – Nonforested	20	20	66
Boulder – Forested	235	475	917
Boulder – Nonforested	93	93	219
Jefferson – Forested	199	453	851
Jefferson – Nonforested	189	189	370
Madison – Forested	5	18	40
Madison – Nonforested	9	9	36
Upper Clark Fork – Forested	9	22	42
Upper Clark Fork – Nonforested	2	2	10
Upper Missouri – Forested	709	1,369	2,651
Upper Missouri –Nonforested	961	961	2,593
Upper Yellowstone – Forested	36	105	234
Upper Yellowstone –Nonforested	122	122	394
Total – Forested	**1,723**	**3,507**	**6,657**
Total – Nonforested	**1,805**	**1,805**	**4,736**
Grand Total	**3,528**	**5,312**	**11,393**

94.3 miles of routes within 300 feet of streams would remain open to motorized use. While this is not a direct indication of road and trail effects on riparian vegetation, it is a relative indication when compared to the other alternatives. Alternative A leaves the greatest mileage of routes within 300 feet of streams open to motorized use of all alternatives.

Under Alternative A, all four eligible Wild and Scenic Rivers would be managed to maintain their eligibility. This would reduce the risk of various land use disturbances of riparian vegetation along 12 miles of river/stream in the Decision Area. Under Alternative C these same stream/river miles would be protected as suitable for WSR designation, whereas Alternatives B would protect 5.7 miles and Alternative D would protect none as suitable for WSR designation.

In the context of oil and gas development, Alternative A stipulates No Surface Occupancy within 500 feet of reservoirs, lakes, ponds and intermittent streams, or within 1,000 feet of perennial streams and rivers. This would minimize effects to riparian vegetation to a similar degree as in Alternatives B, C, and D in reservoirs, lakes, ponds and intermittent streams, and to a greater degree than these alternatives on perennial streams and rivers.

Noxious Weeds

Under Alternative A, noxious weeds and invasive species have the lowest potential for expansion, resulting in up to 43,000 weed acres (a rate of 9 percent/year), from predictable factors in ten years. This analysis assumes that the low end of proposed weed treatment acreage ranges would be implemented under the action alternatives. Of these acres, approximately 13 acres/year are associated with open and limited roads, 66 acres/year with grassland treatments, 38 acres/year with forest treatments, and most of the remainder with natural expansion of established weed infestations on and near the Decision Area.

Wildfires could increase these total expansion acres more in Alternative A than Alternatives B or D and less than Alternative C because wildfire potential is greatest for Alternative C, least for Alternative D, and less for Alternative B than Alternative A as a result of different vegetation management, particularly forest treatments.

Effects on weed potential from oil and gas development are similar for Alternatives A and B, less in Alternative C, and greater in Alternative D. No Surface Occupancy and no lease restrictions remove similar acreages from surface disturbance (and therefore exacerbation of noxious weed spread) in Alternatives A and B, about twice that many acres in Alternative C, and about half that many in Alternative D.

An estimated 20,000 acres per decade would be treated to reduce noxious weeds with 85 to 90 percent of these acres being repeat treatments. Therefore, up to 3,000 acres (15 percent of current populations) per decade of weed infestations would be successfully controlled or eradicated using Integrated Weed Management methods under this alternative.

Vegetation restoration of approximately 5,250 acres of grasslands/shrublands per decade would eventually produce about 4,000 acres per decade of healthy desired vegetation resistant to weed infestations.

Continuing restrictions of a 200 foot aerial herbicide application buffer for riparian areas would result in greater riparian weed control costs associated by increasing ground treatments up to 25 acres/mile of riparian corridor more for Alternative A than Alternatives B and D, but lower costs than Alternative C (by up to 50 acres/mile more).

Effects Common to Action Alternatives

General Vegetation

Restoration of habitat using prescribed fire, silvicultural practices, and other methods would result in protecting and maintaining snags, creating large woody debris and vegetation in a variety of seral stages including mature forest with old forest structure and healthy shrublands and grasslands.

Prohibiting the introduction of biological noxious weed controls that have been documented to damage desirable plant species would reduce negative effects on non-target plants.

Timing restrictions on projects that cause disturbance on big game winter and spring range, big game calving areas, grizzly bear spring and summer range, and grizzly bear denning habitat could impose constraints on vegetation treatments that alter habitat, making it more difficult to meet desired objectives for vegetation change. For example, treatment of noxious weeds is often most effective in spring; however, in the habitats mentioned above, implementation of noxious weed control may not be possible during periods when it is most effective to prevent disturbance to grizzly bear or big game within big game winter/spring range. Similarly, prescribed fire is often most effective and manageable during the spring and early summer when moisture levels are high and temperatures are low. Timing restrictions could inhibit the use of prescribed fires to meet vegetation objectives.

Watershed restoration activities would alter vegetation composition and structure and improve upland, riparian, and aquatic health and functionality.

Rehabilitation of roads would revegetate currently unvegetated roadbeds, which would increase biomass productivity of the landscape through colonization of sites with grasses, forbs, shrubs, and trees on approximately 2½ to 3 acres per mile of rehabilitated road. Eventually, rehabilitated roads would support plant communities consistent with site potentials which would help resist weed invasions. However, road closures and removals could in some cases make vegetation management treatments more difficult and costly, inhibit potential vegetation treatments, reduce public access for product use and removal, and slow fire detection and suppression.

Reseeding disturbed areas would increase the composition of desirable species and reduce the potential for noxious weeds and other invasive species to become established.

Revegetation seed mixes would consist of site-appropriate low-impact, non-invasive species, and native species, generally composed of cool-season species, which initiate growth in early spring in response to winter moisture. These cool-season species would establish stands that are relatively competitive with noxious weeds and other invasive species. Seeded native species sometimes differ from dominant native species occupying foothill sites (rough fescue, Sandberg's blue grass and Idaho fescue) and dryer sites (needle-and-thread, blue grama, and June grass). As a result, some revegetation seedlings may not help establish native species that typically occupy a range of sites with different growing conditions. However, where site-appropriate species are used this would not be the case.

Grasslands and Shrublands

Up to 850 acres of crested wheatgrass, agricultural fields, and weed infestations on the McMasters Hills and Ward Ranch acquisitions would be converted from non-native to native vegetation. Conversions would be labor intensive and could involve repeated cycles of cultivation and/or application of herbicides to kill non-native species followed by seeding with native species. Young stands of native species would be subject to invasion by noxious weeds and other invasive species, and would require management actions such as manual pulling or spot-spraying with herbicides to control unwanted vegetation. Conversely, Alternative A would convert none of these lands to native vegetation.

Forests and Woodlands

Silvicultural treatments including harvest, thinning, other mechanical treatments, and prescribed fire would meet Land Health Standards and improve forest health conditions, by maintaining or mimicking natural disturbance regimes with treatments that reduce conifer stocking in many areas while retaining important mature stand components.

In the treated areas, densities of smaller trees and fuel loading would decrease, and forest canopy continuity would be more open, reducing the risk of severe, high intensity crown fires. Larger trees would be maintained resulting in a more-open forest with a dominant overstory of trees that are relatively resistant to frequent, low-intensity fires that would remove fine fuels and pass

through stands without killing a high percentage of larger trees

These management actions would emphasize old-forest structure characteristics, and would develop and maintain stand structures that are relatively complex with highly variable tree densities, healthy and diverse understory composition, and site-appropriate quantities of snags and down wood.

Protecting big game security cover by maintaining blocks of at least 250 acres that are unroaded or have roads closed during the hunting season could limit vegetation treatment options such as timber harvest, fuels reduction, and tree density reductions. The restriction would not preclude restoration from occurring, but could make treatments in some areas less feasible under the action alternatives.

Riparian Types

Management of riparian areas would result in amounts and distribution of large, woody material, characteristic of healthy riparian and wetland ecosystems. Improved health of riparian vegetation would maintain proper functioning condition or move degraded areas toward proper functioning condition.

Assessing and monitoring riparian areas for proper functioning condition would help identify riparian areas that are functioning at risk or nonfunctioning. This in turn would indicate riparian areas for restorative work.

Reductions in conifer encroachment and fuels management involving removal of conifers to restore historically non-forested riparian areas would improve long-term riparian vegetative conditions. Treatments involving the sale of forest products could potentially be affected by leave tree requirements or equipment prohibitions within streamside management zones in cases where greater levels of conifer removal may be desired than that allowed by the SMZ law. In such cases, the BLM would apply for a variance to the law under "Alternative Practices" to the SMZ Law. The absence of this variance would require that treatments be modified to comply with the state law.

Riparian vegetative treatments would have variable effects on hardwood tree and shrub species. Prescribed fire treatments would likely adversely affect cottonwoods by causing direct mortality. Species such as willow and red osier dogwood would be more resilient and may benefit through stimulated growth from prescribed fire treatments.

The natural expansion and potential reintroduction of beaver could affect vegetation by creating higher water tables through dam construction, which would expand wetland and riparian vegetation. This benefit could be partially counterbalanced by beavers removing favored vegetation species (e.g., cottonwood, aspen, and willow) from areas adjacent to streams and beaver dams, reducing the density of riparian vegetation.

Management direction to minimize road and landing locations in riparian areas would benefit riparian vegetation equally in Alternatives B, C, and D and more than in Alternative A where no such direction is proposed.

Minerals exploration and development activities would remove riparian vegetation in some cases. Impacted areas would be maintained, protected, rehabilitated, and compensated to the extent practicable. This would contribute to re-establishing vegetation species diversity and productivity in the aftermath of potential riparian impacts associated with mineral development activities.

Under Alternatives B, C, and D there would be a No Surface Occupancy stipulation for oil and gas exploration in wetlands, floodplains, and riparian areas. Standard Lease Terms would also apply which would allow the relocation of proposed facilities up to 200 meters (approximately 656 feet) from any areas of concern. These measures would protect riparian vegetation identically in the action alternatives, but potentially less so than in Alternative A on perennial streams or rivers. Alternative A calls for a No Surface Occupancy stipulation within 1,000 feet of perennial streams and rivers. This stipulation would better protect riparian vegetation in rivers or streams with very wide riparian areas (wider than 656 feet) that may not be adequately protected by Standard Lease Terms. There are few, if any, such riparian areas in the Decision Area.

Noxious Weeds

Forest treatments to reduce the risk of high intensity fires would reduce the potential for the increase in weed populations commonly occurring after wildfires. The substantial increase in riparian treatment acres with all action alternatives (compared to Alternative A) would improve these areas' resistance to weed invasion from populations within and on lands adjacent to the Decision Area.

Increasing cooperation with Weed Management Areas (WMAs) would reduce infestations in the Decision Area by comprehensively treating contiguous areas defined by a natural boundary rather than a political one. This would usually improve weed control, prevent or reduce weed expansion into weed-free areas, and decrease the costs of weed treatments. This is because a comprehensive plan would facilitate improved access for treatments, provide for shared treatment resources, allow for more effective coordination of treatment timing, and promote the use of watershed boundaries which are somewhat resistant to weed spread as WMA boundaries.

Discouraging cross-country motorized travel by placement of woody materials and placing gates and barriers on closed roads would decrease weed expansion potential by decreasing disturbance. Utilizing open roads for access requests where possible, not issuing new right-of-ways in exclusion areas, and restricting them in avoidance areas would also reduce weed expansion potential by decreasing disturbance.

Power washing heavy equipment would reduce the introduction of weed seed although heavy equipment use on vegetation treatments and other projects could increase weed spread through disturbance.

Building new roads, including temporary ones for mineral development and timber sales and salvage, using roads and travel routes otherwise closed for mineral development and timber, and building fire lines would cause disturbance, thereby increasing the potential for weed growth.

Effects of Alternative B

General Vegetation

Management to maintain and/or recruit adequate densities of snags and down woody material for wildlife could include prescribed fire, mechanical treatments, and inoculation.

No new, permanent roads would be allowed in big game winter range or calving habitat where road densities are 1 mi/mi^2 or less. Road restrictions could affect options for vegetation treatment (e.g., firewood and Christmas tree harvest, timber harvest, and thinning), but not as much as Alternative C, where permanent roads cannot be built in areas where road densities are 1.5 mi/mi^2 or less.

Restricting vegetation clearing within 250 feet of caves and abandoned mines with populations of bats would limit fuels reduction, tree density reductions, and other treatments that remove vegetation in these areas.

Alternative B restricts noise disturbance and most management activities within a 0.5-mile radius of occupied raptor nests, during the nesting and brooding period. Depending on the species of raptor, this could restrict approximately 500 acres per nest and make prescribed burning difficult in some treatment areas.

Livestock grazing could be permitted on 265,000 acres of public land. Grazing may reduce the density and production of palatable species in localized areas. However, proper grazing level requirements would maintain the density and integrity of most plant communities. Species with low palatability, including most noxious weeds and many other invasive species would increase in density on some sites.

On burned areas and other sites with a high potential for erosion and noxious weed invasion, non-native species may be seeded to stabilize slopes and prevent proliferation of noxious weeds and other invasive species. Seeding of annual species such as triticale, barley, and rye provides vegetation cover for one or two years, but these species die out as seed production declines. Use of annual agronomic species provides organic material to the soil and can act as a nurse crop for native species. Additional seeding with perennial non-native species often initiates persistent stands, which can inhibit colonization by native herbaceous species and conifers.

Similar to Alternative A, most Decision Area land (approximately 255,000 acres, 83 percent) would be managed as Fire Management Unit designation C. The remainder of BLM lands in the Butte field office would be in FMU designation B (approximately 52,000 acres, 17 percent). The effects of FMUs B and C designations are discussed under Effects Common to All Alternatives, General Vegetation.

Alternative B manages for 75,100 acres in VRM Classes I and II where no visual changes would be allowed to be noticeable. This provides less flexibility for vegetation treatments than Alternatives A and D, but more than Alternative C.

Grasslands and Shrublands

Up to 11,800 acres (9 percent of grasslands in Decision Area) of grassland and 3,650 acres (18 percent of shrublands in Decision Area) of shrubland would be treated per decade with prescribed fire, mechanical treatments, and other methods to improve the health and resiliency of these communities by reducing the density of conifers in these habitats. Effects of treatments can be seen by comparing acres treated versus rates at which encroachment is occurring in grasslands and shrublands (**Table 4-2** and **Table 4-3**).

Table 4-2
Alternative B Comparison of Acres of Grassland Treated Versus Rate of Conifer Encroachment

Watershed	Area Treated per Decade	Conifer Encroachment	Encroachment After Treatment	Rate of Encroachment per Decade	Net Effect on Encroachment
Big Hole	2,500	3,398	898	340	1,238
Blackfoot	50	0	0	0	0
Gallatin	200	0	0	0	0
Jefferson	3,000	16,472	13,472	1,647	15,119
Missouri	6,000	29,787	23,787	2,979	26,766
Yellowstone	50	NA	NA	NA	NA
Total	**11,800**	**49,657**	**38,157**	**4,966**	**43,123**

Table 4-3
Alternative B Comparison of Acres of Shrubland Treated Versus Rate of Conifer Encroachment

Watershed	Area Treated per Decade	Conifer Encroachment	Encroachment After Treatment	Rate of Encroachment per Decade	Net Effect on Encroachment
Big Hole	2,000	9,017	7,017	902	7,919
Blackfoot	50	0	0	0	0
Gallatin	50	0	0	0	0
Jefferson	1,000	3,987	2,987	399	3,386
Missouri	500	1,341	841	134	975
Yellowstone	50	100	50	10	60
Total	**3,650**	**14,445**	**10,895**	**1,445**	**12,340**

Grassland treatments could result in a net increase in restored habitats of approximately 6,834 acres per decade (**Table 4-2**). Shrubland treatments could result in a net increase in restored habitats of approximately 2,205 acres per decade (**Table 4-3**). These potential increases under Alternative B would be a benefit to grasslands and shrublands compared to Alternative A in which there would be a net increase in conifer encroachment of approximately 1,161 acres per decade.

Alternative C would treat even fewer acres than Alternative A and would therefore have a net increase in conifer encroachment rather than an increase in restored habitat. Alternative D would treat even more acres than Alternative B and would therefore have a greater net increase in restored habitat than Alternative B.

Overall, Alternative B would reduce conifer encroachment on up to 15,450 acres per decade of grassland and shrubland communities compared to 5,250 acres for Alternative A, up to 2,700 acres for Alternative C, and up to 25,900 acres for Alternative D.

Under Alternative B proposed treatments of grasslands would gradually reduce conifer encroachment in all watersheds; however, restoration to historic levels would require decades of treatment. Proposed treatments of shrublands would gradually reduce conifer encroachment in all watersheds; however restoration to historic levels would require more than ten years.

Under Alternative B prescribed fire projects would be planned to consume above-ground biomass on no more than 80 percent (on average) of area burned on a per treatment unit basis. Prescribed fire would substantially reduce the density of conifer seedlings and saplings on 80 percent of the area treated; however, 20 percent of the treated area would not be burned and conifer encroachment would be present in a mosaic of unburned patches. Alternative C would provide for burning no more than 60 percent of each unit's surface area while Alternative D would provide for burning no more than 90 percent of each unit's surface area.

Alternative B has a timing restriction that would restrict prescribed burning from May-August. This would allow for protection to breeding birds and to protect soil, grasses, and forbs from fire-related mortality that could occur with burns during the hotter, drier months. Alternative C would provide for this same protection while Alternatives A and D do not provide for it.

Under Alternative B, areas identified for prescribed burning would be rested for up to one year prior to treatment (if necessary) and for a minimum of two growing seasons following burning treatments, subject to alteration of these timeframes on a case-by-case basis. This rest from livestock grazing would promote grassland and shrubland vegetative recovery before reapplying livestock grazing. Alternative C calls for similar management but without the flexibility to reduce the post-treatment rest timeframe. The flexibility available under Alternative B may be more accommodating to permittee forage needs when objectives can be met with shorter rest periods. Alternative A calls for rest before and after burning as determined through site-specific planning. Alternative D calls for rest prior to burning if needed, and for rest through one growing season, subject to alteration of these timeframes on a case-by-case basis.

Under Alternatives B and D, BLM would proactively restore the distribution and vigor to mountain mahogany and bitterbrush stands through vegetative treatments designed to reduce competing plants (e.g., encroaching conifers and weeds) and create conditions to promote natural regeneration. Because restoration of stands of these species would be a priority, the vigor and health of communities of these species would likely improve more substantially under Alternatives B and D than under Alternatives A and C where no such proactive restoration is proposed.

Reduction of conifers from bitterbrush and mountain mahogany communities by mechanical means under Alternative B as opposed to prescribed fire would reduce mortality to these species and would benefit them by eliminating competing conifers. The use of prescribed fire would have variable effects on these species depending on a variety of conditions. Bitterbrush is susceptible to fire, often taking 15 to 30 years to recover following moderate to severe fires; however, the potential to sprout after fire is variable depending on fire severity and season, genetic composition, carbohydrate reserves, and

age. Bitterbrush growing in association with plant communities that have relatively frequent fire intervals tend to sprout more frequently than bitterbrush growing on sites where fire has been excluded for long periods. Low intensity, high frequency fires would favor regrowth from sprouting, whereas higher intensity, less frequency fires would favor regeneration by seed.

Like bitterbrush, mountain mahogany is usually killed by fire, even fires of low intensity, and does not resprout. Closed, mature stands may not have sufficient understory to carry fire, so fire-induced mortality may be confined to edges of stands. Regeneration by seed may occur after fire if the soil is not rapidly colonized by other competitive plants.

Overall, Alternative B (grazing on approximately 265,000 acres of all Decision Area lands) would have greater impacts to grasslands and shrublands associated with livestock grazing than Alternative C (approximately 262,000 acres), but less than Alternatives A and D (approximately 273,000 acres). Managing livestock grazing activities in the McMasters Hills, Spokane Hills, and Indian Creek allotments as forage reserve allotments in Alternative B would impact grasslands and shrublands less than in either Alternatives A or D where they would be managed as available for general grazing permits. Alternative B would pose a greater impact to grasslands and shrublands in the Indian Creek allotment than Alternative C in which the Indian Creek allotment would be unavailable for grazing but where McMasters and Spokane Hills allotments would be managed as forage reserve allotments as in Alternative B.

Fine fuel build-up and plant decadence may occur on some grasslands and shrublands in the Centennial Gulch, Free Coinage, Alder Creek, Charcoal Mountain Custodial, Dickie, Maiden Rock Custodial, Quinn Creek, and Wineglass Mountain allotments in Alternative B as these areas would be unavailable for grazing. Alternative C manages these areas the same as Alternative B and would therefore have similar livestock grazing-related impacts. Alternatives A and D would manage these areas as available for general grazing permits and would have impacts described above in "Effects Common to All Alternatives" to grasslands and shrublands associated with them in these areas.

Forests and Woodlands

Harvesting of firewood and other public demand forest products would have effects similar to Alternative A. Firewood removal, however, is more restricted as trees greater than 24 inches diameter would be restricted from cutting under Alternative B, thus leaving more, larger diameter snags on the landscape.

Maintaining a 0.25-mile radius buffer around unoccupied raptor nests in forest habitats for a period of five years would not prevent restorative vegetative management in these areas but suitable habitat would have to be retained around the nest sites. This could restrict some treatments in an area approximately 125 acres in size per nest site.

Dry Forest

Approximately 10,750 acres of high-density stands of dry ponderosa pine and Douglas-fir forest with medium to large-sized trees in the Decision Area would be treated per decade. Additionally, up to 2,000 acres per decade of dry forest stands, currently in ecologically healthy condition, would be treated. These treatments would result in maintenance of large overstory trees and natural regeneration that would provide diverse age and size classes that would periodically burn with low intensity wildland fire. Some regeneration harvesting would occur; probably favoring shelterwood harvesting to convert stands to earlier seral conditions.

Approximately 1,000 acres of limber pine habitat would also be treated with prescribed fire per decade. Burning would reduce the density of limber pine trees and would remove fuels that have built up due to mortality of trees from blister rust.

Approximately 1,000 acres per decade of small diameter thinning of seedlings, saplings, and pole-size trees would reduce density of small trees and reduce fuel loading, resulting in less intense wildland fires.

These actions would also reduce the effects of spruce budworm in treated Douglas-fir stands. Alternative B would have more effect on spruce budworm than Alternatives A and C because more acreage would be treated.

The majority of treatments (7,000 acres, 47 percent) with Alternative B would be in the Upper Missouri River Watershed. Currently, there are 33,973 acres of medium and large size, high density, dry Douglas-fir and ponderosa pine in the Upper Missouri watershed as compared to 6,965 acres historically. Proposed treatments would reduce the acreage of high density trees to 24,073 acres over approximately the next two decades. If it is assumed that the current rate of increase in high density stands has taken place over the past century of fire suppression, the rate of increase would be about 2,700 acres per decade. Four decades of treatments could reduce the acreage of large and medium size class, high density trees, in the Upper Missouri watershed to historic levels.

Proposed treatment of 2,750 acres of high density dry forest with medium to large-sized trees in the Jefferson watershed would reduce current acreages from 19,187 acres to 13,687 acres over a 20-year time span as compared to 4,914 acres historically. Assuming a rate of increased acreage of large and medium size class, high density trees of 1,424 acres per decade (the difference between current acres and historic acres divided by 10 decades of fire exclusion), as a result of fire exclusion, proposed levels of treatment would require nearly 11 decades to approach historic levels in the Jefferson watershed.

Proposed treatments of 1,900 acres of high density dry forest with medium to large-sized trees in the Big Hole watershed would reduce current acreages from 13,733 acres to 10,033 acres over a 20-year time span as compared to 6,768 acres historically. Assuming a rate of increased acreage of large and medium size class, high density trees of 704 acres per decade, proposed levels of treatment would require nearly 6 decades to approach historic levels in the Big Hole watershed.

A total of 14,750 acres of dry forest would be treated per decade to help restore historic conditions compared with 5,100 acres with Alternative A, 4,800 acres with Alternative C, and 18,200 acres for Alternative D. For all dry forest types, deviation from historic conditions has occurred at a rate of 4,958 acres per decade. Only Alternatives A, B and D would restore vegetation at a rate that exceeds the rate of declining forest health.

Cool, Moist Forest

Approximately 3,350 acres (24 percent) of high-density stands of moist Douglas-fir, lodgepole pine, subalpine fir, and Engelmann spruce forest with medium to large-sized trees in the Decision Area would be treated per decade. Additionally, 400 acres of cool, moist forest stands would be thinned pre-commercially, which would remove smaller seedlings, saplings, and pole-sized trees, reducing the risk of intense wildland fire and allowing larger trees to develop a dominant overstory.

Under Alternative B, more treatments are proposed in lodgepole pine stands, as compared to Alternatives A and C; treatments would result in fewer acres that are susceptible to endemic infestation by mountain pine beetle.

Treatments in cool, moist forest types would include even-aged stand management, such as seed tree harvesting, shelterwood cuts, and clearcutting treatment methods, that would regenerate approximately 2,010 acres of cool moist forest, primarily in lodgepole pine and Douglas-fir forest types.

Proposed treatments in the Big Hole watershed of 1,400 acres would reduce current acreages of medium and large size class, high density, trees from 5,533 acres to 4,133 acres, compared to 2,438 acres historically. Assuming a rate of increased acreage of large and medium size class, high density trees of 309 acres per decade, proposed levels of treatment would require 3 decades to approach historic levels in the Big Hole watershed.

Proposed treatments in the Upper Missouri watershed of 1,400 acres would reduce current acreages of stands with medium and large-sized trees with high stem densities from 6,187 acres to 4,787 acres as compared to 4,262 acres historically. Assuming a rate of increased acreage of large and medium size class, high density trees of 193 acres per decade, proposed levels of treatment would require two decades to approach historic levels in the Upper Missouri watershed.

Proposed treatments in the Jefferson watershed of 300 acres would decrease current acreages of medium and large size class, high density trees, from 1,493 acres to 1,193 acres compared to 1,518 acres historically, assuming a rate of increased acreage of large and medium size class, high density trees of 21 acres per decade. While this is 20 percent lower than the historical averages for medium and large size forest types, this action is expected to shift the treated stands toward earlier seral conditions and would start the process of developing earlier seral, seedling, saplings and pole sized stands, which are currently 610 acres or 11 percent of 5,401 acres that occurred historically.

Under Alternative B, a total of 3,750 acres of cool, moist forest per decade would be treated to help restore historic conditions, compared with 2,350 acres with Alternative A, 550 acres with Alternative C, and 5,050 acres for Alternative D. For all cool moist forest types, deviation from historic conditions has occurred at a rate of 1,100 acres per decade. Alternatives A, B and D would restore vegetation at a rate that exceeds the rate of declining forest health.

Riparian Areas

Alternatives B and C would establish Riparian Management Zones (RMZs) wider than Streamside Management Zones. Having RMZs wider than SMZs would create more benefits to riparian vegetation and stream conditions by providing for increased stream shading, increased down woody material recruitment, and wider vegetative "filters" to prevent eroded sediment from reaching streams. This differs from Alternatives A and D where no RMZs would be established and SMZs would perform these functions to a lesser degree.

With Alternative B, there would be approximately 5,312 acres in RMZs in the Decision Area as compared to approximately 11,393 acres in RMZs in Alternative C. Alternatives A and D would both have approximately 3,528 acres in Streamside Management Zones. Under Alternative B mechanical treatments and prescribed fire would maintain, restore, or enhance vegetative diversity and structure in up to 700 acres per decade of riparian communities. These acres would tend to move from a lower functional condition to a higher functional condition. An example would be moving a riparian area (in a historically non-forested area) that is functioning-at-risk to proper functioning condition by cutting or removing conifers that are closing the canopy and shading out the broadleaf tree or shrub species. Treatments to restore functioning condition would be 13 times greater than Alternative A (up to 30 acres per decade), 3.5 times greater than Alternative C (up to 200 acres per decade), but 2.5 times less than Alternative D (up to 1,700 acres per decade).

With Alternative B, timber harvest and removal of wood products would be allowed in RMZs when utilized to help meet riparian objectives. For example, recruitment

of aspen or cottonwood, reducing juniper competition, or enhancing broadleaf shrub communities would meet riparian objectives. Under Alternatives B and D firewood cutting would not be allowed within 100 feet of perennial streams or within 50 feet of intermittent streams. This measure would allow recruitment of woody material to streams and riparian areas to a greater extent than under Alternative A, but to a lesser extent than under Alternative C where limitations would apply within 200 feet of perennial streams and 100 feet of intermittent streams.

Overall, Alternative B (grazing on approximately 265,000 acres) would have slightly greater impacts to riparian vegetation associated with livestock grazing than Alternative C (approximately 262,000 acres), but less than Alternatives A and D (approximately 273,000 acres). Managing livestock grazing activities in the McMasters Hills, Spokane Hills, and Indian Creek allotments as forage reserve allotments in Alternative B could impact riparian vegetation less than in either Alternatives A or D where they would be managed as available for general grazing permits. Alternative B would pose a greater impact to riparian vegetation in the Indian Creek allotment than Alternative C in which the Indian Creek allotment would be unavailable for grazing but where McMasters and Spokane Hills allotments would be managed as forage reserve allotments as in Alternative B.

There would be no impacts to riparian vegetation specifically from livestock grazing in the Centennial Gulch, Free Coinage, Alder Creek, Charcoal Mountain Custodial, Dickie, Maiden Rock Custodial, Quinn Creek, and Wineglass Mountain allotments in Alternative B as these areas would be unavailable for grazing. Alternative C manages these areas the same as Alternative B and would therefore also have no specific livestock grazing-related impacts to riparian vegetation. Alternatives A and D would manage these areas as available for general grazing permits and would have slightly greater impacts to riparian vegetation associated specifically with livestock grazing.

Treating aspen stands to stimulate sprouting and then fencing treated sites to prevent cattle and wildlife browsing and trampling would regenerate aspen stands. Aspen stands would be more actively managed across the landscape in Alternatives B and D (more acres specifically targeted for aspen restoration) compared to the opportunistic management proposed under Alternative C (aspen treated through other higher priority projects) and no specific aspen management included in Alternative A. Because Alternatives B and D would actively restore aspen and propose more acres of restoration than Alternatives A and C, these alternatives would promote and sustain more aspen over the long-term.

Under Alternative B, aerial application of herbicides to treat noxious weeds would not occur within 100 feet of streams or wetlands. This measure increases the chance of inadvertent mortality to non-target riparian vegetation more than either Alternative A (minimum buffer strip is 200 feet wide) or Alternative C which provides for no aerial application of herbicides at all.

Because ground treatments for noxious weeds are more expensive and less efficient than aerial applications, Alternatives B and D would cost more than Alternative A, which in turn would cost more than Alternative C. Because ground treatments take more time and money, the risk of not treating some noxious weed infestations on uplands adjacent to riparian areas is correspondingly higher under alternatives with greater aerial herbicide application restrictions. Under Alternative B, Decision Area-wide, approximately 77.4 miles of routes within 300 feet of streams would remain open to motorized use. This is less than Alternative A (94.3 miles) and Alternative D (81.2 miles), but more than Alternative C (73.7 miles) and suggests that Alternative B has the next to least amount of road-related impacts to riparian vegetation of the alternatives.

Under Alternative B, a total of 5.7 miles of river/stream segments would be recommended as suitable for WSR designation (Muskrat Creek and Missouri River). WSR designation would likely lead to managing a 0.25 mile corridor on either side of these segments to protect the Outstandingly Remarkable Values (ORVs). This would increase protection of riparian vegetation from various potential future land use disturbances, such as utility corridors, timber harvest, or mining along these 5.7 miles. In relation to WSRs, Alternative B would manage more miles of riparian vegetation under WSR designation than Alternative D in which no rivers would be recommended as suitable for designation, but fewer miles than Alternatives A and C where all 12 miles of eligible segments would be managed to protect ORVs.

Alternative B would allow construction of roads and facilities associated with mining activities only when no alternative to locating these facilities outside riparian areas exists. This would minimize impacts such as removal of riparian vegetation, sediment production, streambank disturbance, and invasive plant introductions more than either Alternative A or D where no such provisions would be in place, but less than in Alternative C where no mining-related roads or facilities would be permitted inside RMZs.

Noxious Weeds

Under Alternative B, noxious weeds and invasive species have a similar potential for expansion to Alternative D which is greater than Alternative A and less than Alternative C. This potential could result in up to 48,000 weed acres (a rate of 10 percent/year, assuming implementation of the low end of the proposed range of weed treatment acres), from predictable factors in ten years. Of these acres, approximately 9 acres/year are associated with open and limited roads, 193 acres/year with grassland and shrubland (combined) vegetation treatments, 93

acres/year with forest treatments, and most of the remainder with natural expansion of established weed infestations in the Planning Area.

Weed expansion from new permanent roads for forest vegetation projects would also be similar for Alternatives B and D which would be greater than under Alternative C where no new permanent roads would be permitted.

Up to 50,000 acres per decade would be treated with 85 to 90 percent of these acres being repeat treatments. Therefore, up to 7,500 acres (40 percent of current populations) per decade of weed infestations would be successfully controlled or eradicated using Integrated Weed Management methods under this alternative.

Vegetation restoration of up to 15,450 acres per decade of grasslands and shrublands (combined) could eventually produce up to 12,000 acres per decade of healthy desired vegetation resistant to weed infestations.

Restrictions of a 100-foot minimum aerial herbicide application buffer for riparian areas would result in similar riparian weed control costs as Alternative D, but lower than Alternatives A and C.

Effects of Alternative C

General Vegetation

Alternative C would emphasize the maintenance and protection of diverse habitats, but would restore fewer acres than Alternative B or D. With less acres treated under Alternative C, much treatment would occur in wildland urban interface, as this area is prioritized for treatment.

Areas of habitat enhancement, fire rehabilitation, plantings, seedings, and other restoration projects would be protected from effects of grazing by wildlife and livestock, which would facilitate development of stable, self-sustaining plant communities and stabilize soils.,

Snags and down woody material would be protected rather than created (Alternative B), which may in some cases locally limit the use of prescribed fire to reduce fuel loading, thin dense forest stands, and remove conifer encroachment if high value snag/down wood patches need to be protected..

Restricting permanent, new road construction in areas of big game winter range and calving areas and reducing road densities where they currently exceed 0.5 mi/mi^2could limit vegetation management options that are associated or dependent on roads (e.g., Christmas tree and fire wood gathering). Alternative C would be more restrictive than Alternative B, which limits permanent road density to 1 mi/mi^2, and Alternative D, which would limit permanent road density where they are 0.5 mi/mi^2 or less.

Snags and down woody material would be protected rather than created (Alternative B), which may limit the use of prescribed fire to reduce fuel loading, thin dense forest stands, and remove conifer encroachment.

The restriction on clearing vegetation within 250 feet of the entrance of caves and abandoned mines with populations of bats would have the same effects on vegetation as Alternative B.

Alternative C restricts noise disturbance and most management activities within 1-mile of occupied raptor nests, during the nesting and brooding period. This is the most restrictive of noise disturbance prescriptions of all alternatives and has the greatest potential to limit vegetative restoration because approximately 2,000 acres would be affected per nest.

Only using native species for landscaping, tree plantings, and ground cover at developed campgrounds would necessitate relatively intense management in terms of weed control and establishment of vigorous, self-sustaining communities; however, once native plant communities were established, there would be little or no maintenance such as watering and fertilization, measures often required for non-native vegetation. The effects under other alternatives of using introduced annual cereal crops or other introduced perennials to stabilize slopes, to provide quick ground cover, or to provide competition with invasive species would be foregone.

Visual Resource Management (VRM) and Recreation Opportunity Spectrum (ROS) classifications may affect the potential to manage vegetation with methods that affect visual quality of some areas and that require the availability of permanently open access roads. Management practices such as regeneration harvesting (e.g., clearcutting, seed tree harvests) may conflict with visual management objectives and access would be restricted to existing roads affecting treatment feasibility in many areas, particularly in the semi-primitive motorized ROS areas. Alternative C also places the greatest area, 93,800 acres, into VRM Classes I and II of all alternatives. Although VRM does not preclude vegetation health projects from occurring, meeting objectives could be more difficult due to fewer implementation methods available to meet VRM Classifications.

The FMU designations in this alternative would be: approximately 41,000 acres (13 percent) in Category A; 23,000 acres (8 percent) in Category B; and 243,000 acres (79 percent) in Category C. This alternative is similar to Alternative A, except the percentage of acres that are in FMU Category A is five percent greater. The effects of FMU A, B, and C designations are discussed under Effects Common to All Alternatives, General Vegetation.

Alternative C would provide for a timing restriction on prescribed burning and mechanical treatment projects from May through August. Effects would be greater than with Alternative B, as implementation of many vegetation treatments would have to occur outside this re-

stricted period (unless breeding bird surveys document low impacts of project proposals to migratory birds).

Grasslands and Shrublands

Up to 2,000 acres (1 percent of grasslands in Decision Area) of grassland and 750 acres (4 percent of shrublands in Decision Area) of shrubland would be treated per decade with prescribed fire, mechanical treatments, and other methods to improve health and resiliency of these communities by reducing the density of conifers in these habitats.

Effects of treatments can be seen by comparing acres treated versus rates at which encroachment is occurring in grasslands and shrublands (**Table 4-4** and **Table 4-5**). Grassland treatments would result in a net increase in conifer encroachment into grasslands at a rate of approximately 2,966 acres per decade (**Table 4-4**). Alternative C shrubland treatments would result in a net increase of conifer encroachment at a rate of approximately 695 acres per decade (**Table 4-5**).

Alternative C would result in the greatest reduction of grassland and shrubland habitat quality due to conifer encroachment of all alternatives. Alternative A would result in a lesser reduction of grassland and shrubland habitat quality (approximately 1,161 acres per decade combined) than Alternative C while Alternatives B and D would result in net increases in restored grassland and shrubland habitats.

Under Alternative C prescribed fire projects would be planned to consume aboveground biomass on no more than 60 percent (on average) of areas burned on a per treatment unit basis. This would eliminate most conifer seedlings and saplings on 60 of the area and would leave live conifers in patches on 40 percent of treatment units. This would provide fewer long-term benefits to grassland and shrubland habitats than either Alternative B (burning on no more than 80 percent of surface area) and Alternative D (burning on no more than 90 percent of surface area). Alternative A would have no analogous management guidance.

Under Alternative C, areas identified for prescribed burning would be rested for up to one year prior to treatment (if necessary to produce fuels to carry the prescribed fire) and for a minimum of two growing seasons following burning treatments. As described above for Alternative B, Alternative C would enhance grassland and shrubland vegetation the most of all alternatives in this regard. Rest from livestock grazing would promote grassland and shrubland vegetative recovery before re-applying livestock grazing impacts. Alternative A calls for rest before and after burning as determined through site-specific planning. Alternative B calls for rest for up to one year prior to treatment and for two growing seasons after treatment, subject to alteration of these timeframes on a case-by case basis.

Alternative C would provide for opportunistic restorative treatments of mountain mahogany and bitterbrush communities when associated with other projects. Though the effects of these treatments would be the same as described for Alternative B, beneficial effects to these species would occur on fewer acres than in either

Table 4-4
Alternative C Comparison of Acres of Grassland Treated Versus Rate of Conifer Encroachment

Watershed	Area Treated per Decade	Conifer Encroachment	Encroachment After Treatment	Rate of Encroachment per Decade	Net Effect on Encroachment
Big Hole	250	3,398	3,148	340	3,488
Blackfoot	0	NA	0	0	0
Gallatin	0	NA	0	0	0
Jefferson	500	16,472	15,972	1,647	17,619
Missouri	1,250	29,787	28,537	2,979	31,516
Yellowstone	0	NA	NA	NA	NA
Total	**2,000**	**49,657**	**47,657**	**4,966**	**52,623**

Table 4-5
Alternative C Comparison of Acres of Shrubland Treated Versus Rate of Conifer Encroachment

Watershed	Area Treated per Decade	Conifer Encroachment	Encroachment After Treatment	Rate of Encroachment per Decade	Net Effect on Encroachment
Big Hole	450	9,017	8,567	902	9,469
Blackfoot	0	0	0	0	0
Gallatin	0	0	0	0	0
Jefferson	200	3,987	3,588	399	3,987
Missouri	100	1,341	1,241	134	1,375
Yellowstone	0	100	100	10	110
Total	**750**	**14,445**	**13,496**	**1,445**	**14,940**

Alternative B or D where a more proactive approach would be taken to maintain and restore populations of these species.

Under Alternative C, livestock grazing would be permitted on 262,000 acres of Decision Area lands, the lowest acreage of any alternative. Impacts to grasslands and shrublands from livestock grazing would be slightly less in Alternative C than in Alternative B because three allotments (Indian Creek, Dog Paw, Sixmile Park County) available as either forage reserve allotments or for general grazing permits in Alternative B would not be available for grazing in Alternative C. All of these allotments would be available for general livestock grazing permits in Alternatives A and D and would therefore have grassland and shrubland impacts associated with them in these alternatives. Alternative C poses the least impacts to grasslands and shrublands due to livestock grazing of all the alternatives.

Forests and Woodlands

Harvesting of Christmas trees and other forest products would have similar effects to the other alternatives with fewer products being harvested since there would be fewer open roads for public access to the forested areas.

No dead trees could be removed for firewood except in specifically designated areas, so the effects of firewood removal would be limited to those specific areas designated for firewood cutting. The current cooperative USFS-BLM permitting system for personal use firewood cutting would be dropped and would not match current public firewood cutting practices on nearby National Forest lands. Some confusion with the public is likely to occur and additional education and enforcement actions are anticipated. More dead fuel would remain, and the potential large snag and down woody material development would increase as the diameter limit for live tree firewood removal in Alternative C would be 20 inches, a firewood diameter restriction that is the smallest, and therefore most restrictive, of the alternatives.

Existing and developing old forests would be retained and protected from land use actions, stand-replacing wildland fire, and insects and disease through active treatments and restoration activities, where access to complete the treatment work is available. The amount of helicopter use in treatments is anticipated to be the highest under this alternative, however treatable stands would need to occur near accessible landing sites and have sufficient quantities of commercial materials to offset all or part of potential high costs of the equipment to remain feasible. These access factors could limit the amount of forest and woodland areas that could be effectively treated, compared to the other alternatives. Forest and woodland areas that currently do not have existing access or could not be feasibly treated by helicopter would not receive forest management or fuel reduction actions and would be left as is, subject to current stand conditions, vegetative trends, and natural events.

Alternative C requires 0.5 mile radius maintenance buffers around unoccupied raptor nests in forest habitats for a period of seven years. This is the most restrictive of the alternatives in this regard as it affects the largest acreage, 500 acres per site, for the longest period of time.

Dry Forest

Approximately 4,000 acres of high-density stands of dry ponderosa pine and Douglas-fir forest with medium to large-sized trees in the Decision Area would be treated per decade.

Additionally, 500 acres per decade of dry forest stands, currently in ecologically healthy condition, would be treated. These treatments would result in maintenance of large overstory trees and natural regeneration that would provide diverse age and size classes that would periodically burn with low intensity wildland fire.

Although treatments in Douglas-fir stands may have a localized effect on western spruce budworm, Alternative C treats the least acreage of all the alternatives, and will have the least effect on spruce budworm overall.

Proposed treatments in the Upper Missouri watershed would affect 2,300 acres, reducing the acreage of medium and large size tree class, high density ponderosa pine and Douglas-fir from approximately 33,973 acres to 29,373 acres over a 20-year time span compared to 6,965 acres historically. Assuming that the acreage of high density trees has increased at a rate of 2,700 acres per decade, as a result of fire suppression over the last century, the proposed treatments would not keep pace with the rate at which high density stands of Douglas-fir and ponderosa pine are developing.

Proposed treatments in the Jefferson watershed would affect 1,300 acres of high density forest with medium to large-sized trees, reducing the acreage of stands dominated by medium and large size class Douglas-fir and ponderosa pine from 19,187 acres to 16,623 acres over a 20-year time span. Assuming that the acreage of high density trees has increased at a rate of 1,424 acres per decade, as a result of fire suppression over the last century, the proposed treatments would not keep pace with the rate at which high density stands of Douglas-fir and ponderosa pine are developing.

Proposed treatments in the Big Hole watershed would affect 500 acres, reducing the acreage of medium and large size class Douglas-fir and ponderosa pine from 13,733 acres to 12,733 acres over a 20-year time span, compared to 6,768 historically. Assuming that the acreage of high density trees has increased at a rate of 704 acres per decade, as a result of fire suppression over the last century, the proposed treatments would not keep pace with the rate at which high density stands of Douglas-fir and ponderosa pine are developing.

Cool, Moist Forest

Approximately 550 acres (4 percent of Decision Area total) of high-density stands of moist Douglas-fir, lodgepole pine, subalpine fir, and Engelmann spruce forest with medium to large-sized trees in the Decision Area would be treated per decade.

Additionally, 50 acres of cool, moist forest stands would be thinned pre-commercially, which would remove smaller seedlings, saplings, and pole-sized trees, reducing the risk of intense wildland fire and allowing larger trees to develop a dominant overstory.

Alternative C treats the least amount of acres of cool, moist forest as compared to the other alternatives, and will have the least impact on endemic mountain pine beetle infestations, accordingly.

Treatments in cool, moist forest types would include even-aged stand management, such as seed tree harvesting, shelterwood cuts, and clearcutting treatment methods, that would regenerate approximately 330 acres of cool moist forest, primarily in lodgepole pine and Douglas-fir forest types.

Proposed treatments of medium and large tree size class, high density, stands in the Upper Missouri watershed would affect 250 acres per decade, reducing the acreage of high density stands from 6,187 acres to a total of 5,937 acres, compared to 4,262 acres historically. Assuming that the acreage of high density trees has increased at a rate of 193 acres per decade, the proposed treatments would reduce the amount of medium and large size class, high density stands by less than one percent per decade.

Proposed treatments of medium and large tree size class, high density, stands in the Big Hole watershed would affect 175 acres per decade, reducing the acreage of high density stands from 5,533 acres to a total of 5,358 acres, compared to 2,438 acres historically. Assuming that the acreage of high density trees has increased at a rate of 309 acres per decade, the proposed treatments would reduce the rate of increase by 57 percent, but would not keep pace with the rate at which high density stands of Douglas-fir and ponderosa pine are developing.

Proposed treatments in the Jefferson watershed of 50 acres per decade would decrease current acreages of medium and large size class, high density trees, from 1,493 acres to 1,464 acres assuming a rate of increased acreage of large and medium size class, high density trees of 21 acres per decade, compared to 1,518 acres historically. This is less than a two percent change in the amount of medium and large size class, high density cool, moist forest in the Jefferson watershed.

A total of 600 acres of cool, moist forest and woodland per decade would be treated per decade under Alternative C. It is the only alternative that continues the current approximate levels of cool moist forest, with a general decline in forest health continuing in many areas with limited access.

Riparian Types

Alternative C would establish wider Riparian Management Zones (RMZs) than Alternative B. Similar to Alternative B, riparian goals, and objectives would be the primary management emphasis in these areas. Alternative C would provide for approximately 11,393 acres in RMZs, compared to approximately 5,312 acres in Alternative B. Since Alternatives A and D provide only for narrower Streamside Management Zones (approximately 3,528 acres), Alternative C would reduce the risk of more adverse human-caused disturbances than the other alternatives.

Mechanical treatments and prescribed fire would maintain, restore, or enhance vegetative diversity and structure in up to 200 acres per decade of riparian communities under Alternative C. This is a lesser rate of restorative treatments than with Alternatives B and D, but more than with Alternative A.

Woody materials cut for riparian restoration activities under Alternative C would be retained on site, providing down wood for streams and riparian function, making available organic material for fungi and invertebrates, and increasing organic matter in soil. At the site level this would benefit riparian communities on the whole more than with any other alternative. All other alternatives allow for removal of commercial forest products from riparian communities.

Under Alternative C firewood cutting would not be allowed within 200 feet of perennial streams or within 100 feet of intermittent streams. This restriction would allow recruitment of more woody material to streams and riparian areas than with any other alternative.

Natural processes would determine the structure and composition of aspen stands under Alternative C. If consistent with other project objectives, aspen would also be treated opportunistically. This would reinvigorate aspen communities less than either Alternative B or Alternative D where aspen stands would be proactively restored, but more than Alternative A where particular aspen management would not occur.

Impacts to riparian vegetation from livestock grazing would be slightly less in Alternative C than in Alternative B because three allotments (Indian Creek, Dog Paw, Sixmile Park County) available as either forage reserve allotments or for general grazing permits in Alternative B would not be available for grazing in Alternative C. All of these allotments would be available for general livestock grazing permits in Alternatives A and D and would therefore have riparian vegetation impacts associated with them in these alternatives. Alternative C poses the least impacts to riparian vegetation associated with livestock grazing of all the alternatives.

Alternative C provides for no aerial application of herbicides to treat noxious weeds. This would provide the most protection to riparian vegetation from inadvertent herbicide-related mortality of desirable vegetation of all alternatives because aerial applications would be allowed under all other alternatives.

Under Alternative C, Decision Area-wide, approximately 73.7 miles of routes within 300 feet of streams would remain open to motorized use. This is the least of all alternatives and suggests that Alternative C would have the least road-related impacts to riparian vegetation of all alternatives.

Under Alternative C, all 12 miles of eligible river/stream segments would be recommended as suitable for WSR designation (Muskrat Creek, Missouri River, Moose Creek, and Upper Big Hole River). WSR designation would likely lead to managing a ¼-mile corridor on either side of these segments to protect the ORVs. This would increase protection of riparian vegetation from various land use disturbances along these 12 miles.

Under Alternative C the potential Spokane Creek ACEC (14 acres) would be designated. Proposed ACEC management would increase protection of riparian vegetation in this area by not allowing new road construction, closing the area to new rights-of-way and R&PP leases, and providing for No Surface Occupancy for oil and gas exploration. The activities listed above could potentially disrupt the stream channel, upset the spawning gravels, and remove the vegetation that provides shade and filters sediment. These measures would not be in place in Alternatives A, B and D because this potential ACEC is not proposed in those alternatives.

Under Alternatives C, the proposed withdrawal from mineral entry of 180 acres of riparian areas in the Muskrat Creek drainage would protect riparian vegetation in these areas from impacts associated with mining activities more than under Alternatives A , B and D that do not provide for this proposed mineral withdrawal. Muskrat Creek is a particularly sensitive area because the stream supports a healthy population of westslope cutthroat trout that is used to help repopulate other creeks and streams.

Prohibiting new mineral operation roads and facilities inside RMZs under Alternative C would provide additional protection to riparian vegetation beyond that provided in any other alternative. All other alternatives would allow for mining facility and road construction in riparian areas under certain conditions.

Noxious Weeds

Under Alternative C, noxious weeds and invasive species have the greatest potential for expansion, resulting in up to 51,000 weed acres (a rate of 11 percent/year assuming implementation of the low end of the proposed range of weed treatment acres), from predictable factors in ten years. Of these acres, approximately 8 acres/year are associated with open and limited roads, 34 acres/year with grassland and shrubland (combined) vegetation treatments, 27 acres/year with forest treatments, and most of the remainder with natural expansion of established weed infestations on and near the Decision Area.

Wildfires could increase these total expansion acres more in Alternative C than any other alternative because it has the least reduction in fire potential from vegetation treatments. Alternative C restrictions where salable minerals may be sold only to state and county sales or from community pits and not permitting new roads for mineral development would reduce potential weed spread by decreasing disturbances associated with access to salable mineral sites.

Camping restrictions on Holter and Hauser Lakes would have the greatest reduction in potential weed expansion from introducing seed sources under Alternative C because camping could only occur in developed sites. This would be more restrictive than Alternative B where camping could occur in developed or designated undeveloped sites and Alternatives A and D which have no camping restrictions.

Up to 38,000 acres per decade would be treated to reduce noxious weeds with 85 to 90 percent of these acres being repeat treatments. Therefore, up to 5,700 acres (30 percent of current populations) per decade of weed infestations would be successfully controlled or eradicated using Integrated Weed Management methods under this alternative.

Vegetation restoration of up to 2,750 acres of grasslands and shrublands (combined) per decade could eventually produce up to 2000 acres per decade of healthy desired vegetation resistant to weed infestations.

Riparian weed treatments would be the most expensive under Alternative C because no aerial treatments would be permitted in riparian areas, so more expensive ground treatments would be required. Also, restrictions on using sheep grazing for weed control near bighorn sheep habitat exclude the most area under Alternative C which would also increase treatment costs; thereby decreasing the acres possible to treat in the Decision Area.

Impacts from the revegetation seed mix would be the same as with Alternative B.

No new, permanent roads would be allowed in big game winter range or calving habitat where road densities are mines with bat populations. Having no related action provides more flexibility in these areas than under Alternatives B and C.

Effects of Alternative D

General Vegetation

Livestock grazing would be permitted on 273,000 acres of public land. Effects would be the same as those described under "Effects Common to All Alternatives" for

Grasslands and Shrublands, 0.5 mi/mi^2 or less. Road restrictions could affect options for vegetation treatment (e.g., firewood and Christmas tree harvest, timber harvest, and thinning), but less than with the other action alternatives.

Similar to Alternative A, no restrictions would be placed on vegetation treatments near caves and abandoned mines with populations of bats.

Alternative D restricts noise disturbance and most management activities within 0.25-mile, or 125 acres, of occupied raptor nests, during the nesting and brooding period. This is the least restrictive of noise disturbance prescriptions under the action alternatives and is less likely to impede vegetative treatments than Alternatives B and C.

Prescribed burning could take place at any time of the year, which could affect mortality of vegetation if burning were to occur during conditions that would lead to high burn intensity and severity. No timing restrictions on burning would also increase the feasibility of implementing burning treatments.

The FMU designation in this alternative would be approximately 42,000 acres (14 percent) in Category B; 82,000 acres (27 percent) in Category C; and 183,000 acres (59 percent) in Category D. In FMU Category D, fire is desired with no constraints. These areas offer the greatest opportunity to use the full range of options available for managing wildland fire under the appropriate management response, including wildland fire use for resource benefit. The effects of FMUs B, C, and D designations are discussed under Effects Common to All Alternatives, General Vegetation.

Alternative D places the fewest acres, 32,800 in VRM Classes I and II. This alternative provides for the greatest flexibility in the VRM classes to accomplish vegetation health objectives without potentially conflicting with VRM objectives. With fewer visual restrictions, project planning and implementation could utilize a wider range of available tools.

Grasslands and Shrublands

Up to 19,050 acres (14 percent of grasslands in Decision Area) of grassland and 6,800 acres (34 percent of shrublands in Decision Area) of shrubland would be treated per decade with prescribed fire, mechanical treatments, and other methods to improve health and resiliency of these communities by reducing the density of conifers in these habitats. Effects of treatments can be seen by comparing acres treated versus rates at which encroachment is occurring in grasslands and shrublands (**Table 4-6** and **Table 4-7**).

Grassland treatments could result in a net increase in restored habitats of approximately 13,373 acres per decade under Alternative D (**Table 4-6**). Shrubland treatments could result in a net increase in restored habi-

Table 4-6
Alternative D Comparison of Acres of Grassland Treated Versus Rate of Conifer Encroachment

Watershed	Area Treated per Decade	Conifer Encroachment	Encroachment After Treatment	Rate of Encroachment per Decade	Net Effect on Encroachment
Big Hole	3,500	3,398	0	399	399
Blackfoot	100	NA	0	0	0
Gallatin	400	NA	0	0	0
Jefferson	6,000	16,472	10,472	1,647	12,119
Missouri	9,000	29,787	20,787	2,979	23,766
Yellowstone	50	NA	NA	NA	NA
Total	**19,050**	**49,657**	**31,259**	**5,025**	**36,284**

Table 4-7
Alternative D Comparison of Acres of Shrubland Treated Versus Rate of Conifer Encroachment

Watershed	Area Treated per Decade	Conifer Encroachment	Encroachment After Treatment	Rate of Encroachment per Decade	Net Effect on Encroachment
Big Hole	4,000	9,017	5,017	902	5,919
Blackfoot	100	0	0	0	0
Gallatin	100	0	0	0	0
Jefferson	1,500	3,987	2,487	399	2,886
Missouri	1,000	1,341	341	134	475
Yellowstone	100	100	0	10	10
Total	**6,800**	**14,445**	**7,845**	**1,445**	**9,290**

tats of approximately 5,155 acres per decade (**Table 4-7**). These potential increases in restored grassland and shrubland habitats are greater than with any alternative and would represent the greatest potential long-term benefits of any alternative.

Proposed treatments would exceed the rate at which conifers are encroaching on grasslands; however, restoration of historic conditions would take approximately 3.5 decades if the upper end of proposed Alternative D treatment rates were applied. Restoration of historic conditions in shrublands would take nearly 3 decades if the upper end of proposed Alternative D treatment rates were applied.

Under Alternative D prescribed fire projects would be planned to consume aboveground biomass on no more than 90 percent (on average) of areas burned on a per treatment unit basis. This would eliminate most conifer seedlings and saplings on 90 of the area and would leave live conifers in patches on 10 percent of treatment units.

This would provide greater long-term benefits to grassland and shrubland habitats than either Alternative B or C. Alternative A would have no analogous management guidance.

Unlike Alternatives B and C, Alternative D (along with Alternative A) would not provide for a summer seasonal restriction on prescribed fire projects. Prescribed fires during the summer months could be more severe and intense than those in either spring or fall. Such burns under Alternative D could have more severe, longer term adverse effects to grasslands and shrublands associated with mortality of desired vegetation (as described for Alternative A) than in Alternatives B and C where prescribed fire would not be applied from May through August.

Alternative D calls for rest from livestock grazing prior to prescribed burning projects (if needed to produce fine fuels to carry prescribed fire), and for rest through one growing season after burning projects to allow vegetative recovery, subject to alteration of these timeframes on a case-by-case basis. Post-burn recovery of grassland and shrubland vegetation may be slower due to the plants' increased palatability to livestock after one growing season of recovery than under Alternatives B and C that both call for two growing seasons of rest from livestock grazing after prescribed burning projects.

Like Alternative B, Alternative D would provide for proactive restoration of mountain mahogany and bitterbrush communities. Effects would be the same as described for Alternative B.

Effects of livestock grazing on grasslands and shrublands in Alternative D would be the same as those described for Alternative A.

Forests and Woodlands

Impacts on late forest structure would be the same as Alternative B.

The effects of Christmas tree harvest would be similar to Alternative B, though removal of more trees in Alternative D would potentially remove more encroachment. Similarly, the effect of firewood removal would be the same as with Alternative B.

The 0.25-mile protection buffer (affecting 125 acres) surrounding unoccupied raptor nests for a period of 3 years would have the least effect on vegetative treatments of the action alternatives. The area affected would be the same as Alternative B but the maintenance period would be 2 years less.

Dry Forest

Approximately 12,200 acres of high-density stands of dry ponderosa pine and Douglas-fir forest with medium to large-sized trees in the Decision Area would be treated per decade.

Additionally, 3,500 acres per decade of dry forest stands, currently in ecologically healthy condition, would be treated. These treatments would result in maintenance of large overstory trees and natural regeneration that would provide diverse age and size classes that would periodically burn with low intensity wildland fire.

About 1,000 acres of limber pine habitat would also be treated with prescribed fire per decade. Burning would reduce the density of limber pine trees and would remove fuels that have built up due to mortality of trees from blister rust.

Approximately 1,500 acres per decade of small diameter thinning of seedlings, saplings, and pole-size trees would reduce density of small trees and reduce fuel loading, resulting in less intense wildland fires.

Alternative D would have the greatest effect on reducing potential impacts by western spruce budworm since the greatest acreage of dry Douglas-fir forest is treated under this alternative. Thinning stands and removing encroachment will reduce defoliation and leave stands less vulnerable to insect infestation. Less spruce budworm defoliation will also make dry forests less susceptible to Douglas-fir beetle infestation as stands will be more vigorous after treatment.

Proposed treatments in the Upper Missouri watershed would affect 5,500 acres of medium and large tree size class, high density ponderosa pine and Douglas-fir, reducing the acreage from 33,973 acres to 22,973 acres over a 20-year time span, compared to 6,965 acres historically. Assuming that the acreage of high density trees has increased at a rate of 2,700 acres per decade as a result of fire suppression over the last century, the proposed treatments would result in a reduction in the acreage of high density stands to historic levels with nearly 10 decades of repeated treatments.

Proposed treatments in the Jefferson watershed would affect 3,000 acres of medium and large tree size class Douglas-fir and ponderosa pine, reducing the acreage from 19,187 acres to 13,187 acres over a 20-year time span, compared to 4,914 acres historically. Assuming that the acreage of high density trees has increased at a rate of 1,424 acres per decade as a result of fire suppression over the last century, the proposed treatments would result in a reduction in the acreage of high density stands to historic levels with approximately 9 decades of repeated treatments.

Proposed treatments in the Big Hole watershed would affect 2,300 acres of medium and large tree size class Douglas-fir, reducing the acreage from 13,733 acres to 9,133 acres over a 20-year time span, compared to 6,690 acres historically. Assuming that the acreage of high density trees has increased at a rate of 704 acres per decade as a result of fire suppression over the last century, the proposed treatments would result in a reduction of the acreage with high density stands to historic levels with over 4 decades of repeated treatments.

Cool Moist Forest

Approximately 4,450 acres (32 percent) of high-density stands of moist Douglas-fir, lodgepole pine, subalpine fir, and Engelmann spruce forest dominated by medium to large-sized trees in the Decision Area would be treated per decade. Additionally, 600 acres of cool, moist forest stands would be thinned pre-commercially, which would remove smaller seedlings, saplings, and pole-sized trees, reducing the risk of intense wildland fire and allowing larger trees to develop a dominant overstory.

Treatments in cool, moist forest types would include even-aged stand management, such as seed tree harvesting, shelterwood cuts, and clearcutting treatment methods, that would regenerate approximately 2,670 acres of cool moist forest, primarily in lodgepole pine and Douglas-fir forest types.

Alternative D has the greatest potential to impact future and existing and endemic mountain pine beetle infestations within the DA. Treatments would result in the fewest acres susceptible to pine beetle infestation, as compared to all other alternatives.

Proposed treatments of medium and large tree size class, high density, stands in the Upper Missouri watershed would affect 2,050 acres per decade, reducing the acreage of high density stands from 6,187 acres to 4,137 acres, compared to 4,262 acres historically. Assuming that the acreage of high density trees has increased at a rate of 193 acres per decade as a result of fire suppression over the last century, the proposed treatments would result in a reduction of the acreage with high density stands to historic levels with about 1 decade of treatments.

Proposed treatments of medium and large tree size class, high density, stands in the Big Hole watershed would affect 1,500 acres per decade, reducing the acreage of high density stands from 5,533 acres to 4,033 acres, compared to 2,438 acres historically. Assuming that the acreage of high density trees has increased at a rate of 309 acres per decade as a result of fire suppression over the last century, the proposed treatments would result in a reduction of the acreage with high density stands to historic levels after 3 decades of treatments.

Proposed treatments of medium and large size class, high density, stands in the Jefferson watershed would affect 500 acres per decade, reducing the acreage of high density stands from 1,493 acres to 993 acres, compared to 1,518 acres historically, assuming the acreage of high density trees has increased at a rate of 21 acres per decade. While this is 32 percent lower than the historical averages for medium and large size forest types, this action is expected to shift the treated stands toward earlier seral conditions and would start the process of developing earlier seral, seedling, saplings and pole sized stands, which are currently 610 acres or 11 percent of 5,401 acres that occurred historically.

Alternatives D would restore cool moist forest vegetation at a rate higher than all the other alternatives.

Riparian Types

Like Alternative A, Alternative D would provide for Streamside Management Zones. Approximately 3,528 acres within the Decision Area would be in SMZs. Effects of this would be the same as described for Alternative A.

Under Alternative D mechanical treatments and prescribed fire would maintain, restore, or enhance vegetative diversity and structure in up to 1,700 acres per decade of riparian communities. This is the greatest treatment rate of any alternative, so Alternative D would potentially restore riparian vegetative communities at a greater rate than any of the alternatives. However, if the minimum constraints of SMZs would be applied to these treatments, then site-level benefits would be less than under Alternatives B and C where RMZs and associated site-specific riparian objectives would be applied. Timber harvest within SMZs could occur in Alternative D with effects the same as in Alternative A.

Alternative D would provide for the same firewood cutting limitations in riparian areas as would Alternative B. Effects would be the same as in Alternative B.

Like Alternative B, maintaining and restoring aspen stands would be a priority under Alternative D. Alternative D would affect aspen stands similarly to Alternative B at the site scale and on more acres than any other alternative Decision Area-wide.

Aerial application of herbicides to treat noxious weeds would not occur within 100 feet of streams or wetlands in Alternative D. This would provide less protection to

riparian vegetation from inadvertent mortality than under Alternatives A or C.

Under Alternative D, approximately 81.2 miles of motorized routes within 300 feet of streams would remain open to motorized use Decision Area-wide. This is less than in Alternative A but more than in Alternatives B and C. This suggests that Alternative D would pose the next greatest amount of impact associated with roads to riparian vegetation of all alternatives.

Under Alternative D none of the four river segments eligible for Wild and Scenic River designation would be recommended as suitable for designation. The effects associated with WSR designations would be foregone.

Alternative D would allow for construction of mining-related roads and facilities in riparian areas using BMPs to minimize adverse effects. This would allow more disturbance of riparian vegetation than with either Alternative B or C and effects would be similar to Alternative A.

Noxious Weeds

Under Alternative D, noxious weeds and invasive species would have a similar potential for expansion as Alternative B which would be greater than Alternative A and less than Alternative C. This potential could result in up to 47,000 weed acres (a rate of 10 percent/year assuming implementation of the low end of the proposed range of weed treatment acres), from predictable factors in ten years. Of these acres, approximately 10 acres/year are associated with open and limited roads, 323 acres/year with grassland and shrubland (combined) vegetation treatments, 116 acres/year with forest treatments, 9 acres/year with riparian treatments, and the remainder with natural expansion of established weed infestations in the Planning Area.

Wildfires could increase these total expansion acres less under Alternative D than with any other alternative because that alternative proposed the most reduction in fire potential from vegetation treatments.

Up to 61,000 acres per decade would be treated to reduce noxious weeds with 85 to 90 percent of these acres being repeat treatments. Therefore, up to 9,200 acres (45 percent of current populations) per decade of weed infestations would be successfully controlled or eradicated using Integrated Weed Management methods under this alternative.

Vegetation restoration of up to 25,850 acres of grasslands and shrublands (combined) would eventually produce up to 19,000 acres of healthy desired vegetation resistant to weed infestations.

Restrictions of a 100 foot aerial herbicide application buffer for riparian areas would result in the lowest riparian weed control costs of all the alternatives.

WILDLIFE

Effects Common to All Alternatives

Because of the programmatic nature of the proposed alternatives, qualitative effects from management activities on wildlife are addressed under "Effects Common to All Alternatives." Some effects may vary due to the degree of an activity such as the acres of vegetative treatments or road closures. These "quantitative" effects are addressed under each alternative. More specific analysis would be required to determine the extent of potential impacts from site specific management actions. This analysis would be completed when a management action is clearly defined.

Proposed management of the following resource programs would have no anticipated impacts to wildlife; Air Quality, Paleontology, Cultural Resources, Visual Resources, Economics, and Environmental Justice.

Habitat improvement projects would be implemented to restore or improve wildlife habitat for a wide variety of species.

The restorative treatments of uneven-age management in dry forest types using prescribed fire and mechanical treatments including thinning commercial and non-commercial trees, chipping, and grinding would mimic pre-fire suppression processes (Graham et al. 2004). This would improve the quantity and quality of habitat for wildlife dependent on a variety of size classes and densities but especially those that depend on mature open stands of ponderosa pine and Douglas-fir forests. Management towards large diameter trees would improve snag habitat for primary and secondary cavity users. Restoration and management of dry forests would increase habitat for a wide variety of resident and migratory birds as well as breeding, foraging, and hiding habitat for large and small mammals, amphibians, and reptiles.

Uneven-aged management within cool, moist forests would focus on reduction of stem density and creating small openings that would be beneficial to many of the wildlife species that occur in this vegetation community. Creation of small openings would increase vegetation diversity and available forage, especially for species such as the Canada lynx. Cool forests would also be thinned, when necessary, to promote old forest characteristics, provide habitat diversity, and reduce the risk for epidemic levels of insects and disease.

Reduction in tree densities and restoration of forest habitats would move vegetation towards the natural range of variation, especially in dry forest types, and increase the quality and quantity of big game winter range as well as breeding, denning, foraging, and hiding habitat for a variety of wildlife species. Moving vegetation towards the range of natural variability would increase vegetation diversity and habitat for large and small mammals, migratory and resident birds, and rep-

tiles. Short-term disturbance and displacement of wildlife could occur during project implementation and treated areas could be temporarily avoided. However, it is expected that the long-term benefits to a wide variety of species from restoring vegetative communities would outweigh the short-term negative effects.

A change in vegetation density could reduce the amount of habitat available for certain species while increasing habitat for others. For example, reducing dense forest to increase security habitat for bighorn sheep would decrease the amount of hiding and, possibly, thermal cover for elk. During project planning, the effects of treatments at the landscape scale would be addressed to determine the change in habitats, species affected, short and long-term effects to species and their habitats, the percent of habitat change across the landscape and which wildlife species would benefit or be negatively impacted by project implementation. The importance of big game security habitat and hiding and thermal cover would be considered during project planning.

Thinning forest stands that are subject to severe, uncharacteristic wildfire events, as well as those threatened by epidemic outbreaks of insects or disease would reduce the loss of large areas of habitat. Epidemics of insects and disease can have long-term negative impacts to some wildlife species while those species dependent on snag habitat and down woody material may benefit from increased foraging and nesting habitat.

Timber salvage would result in the loss of wildlife habitat for those species that depend on dead and dying forests. Maintaining patches of dead and dying forest would help to retain habitat features for these species but the affects to snag dependant species would vary greatly depending on the size of patches remaining after salvage. Timber salvage could have minor to major effects to those species that depend on dead and dying forest.

Treatment of grasslands and shrublands using prescribed fire and appropriate mechanical methods to reduce conifer encroachment would reduce the density of conifers and restore habitat for species dependent upon these vegetation communities. Maintenance and restoration of grassland and shrubland communities would ensure long-term quality habitat for big game winter range, calving habitat, and forage and nesting habitat for a variety of resident and migratory grassland and sagebrush bird species. Treatments could cause individuals to leave an area during project implementation but this is expected to be short-term. Since removing conifers from grasslands and shrublands would alter the amount and type of available habitat, wildlife species would be affected in different ways. For example, the removal of conifers may reduce hiding and thermal cover for big game but would increase the amount of forage available for these species. Reducing the density of conifers could also reduce nesting and foraging habitat for forest bird species but would increase nesting and foraging habitat for grassland and shrubland bird species. Overall, the benefits of restoring grassland and shrubland habitat would outweigh the negative effects to those species currently using encroached grasslands and shrublands.

Riparian areas support a higher diversity of plants and animals than non-riparian land. This is a result of the wider range of habitats and available food as well as the proximity to water, microclimate, and refuge. Many native plants are found only, or primarily, in riparian areas, and these areas are essential to many animals for all or part of their lifecycle. Riparian areas also provide refuge for native plants and animals in times of stress, such as drought or fire, and provide critical corridors for wildlife movement.

Riparian and wetland restoration, including implementing Land Health Standards, and conducting all activities in a manner that would strive to maintain or restore riparian structure and function would improve habitat for resident and migratory birds, bats, reptiles and amphibians, and wildlife that use riparian areas for breeding, foraging, overwintering, or migration. Modifying grazing practices in riparian areas that retard or prevent attainment of riparian goals would benefit a multitude of species over the long-term. Riparian habitats would also be protected by not allowing incident bases, camps, helibases, or staging areas inside riparian areas during fire suppression activities.

Reducing conifer encroachment from riparian vegetation would increase the amount, health, and vigor of riparian vegetation preferred by resident and migratory birds as well as for a wide diversity of other species for breeding, brood rearing and foraging. The health and vigor of aspen, willows, cottonwoods, and riparian shrub species would improve with the removal of competing conifers. Within forest-dominated riparian areas, thinning dense conifer stands would allow for an increase in the size and diameter of remaining conifers to provide breeding and foraging habitat for many species of reptiles, amphibians, small and large mammals and numerous bird species.

The Streamside Management Zone Law provides the minimum regulatory standards for forest practices in Streamside Management Zones (SMZs) (**Appendix E**). The SMZs provide protection to water quality, streambank stability, down woody material and shade by restricting certain forest activities such as clearcutting, operation of wheeled or tracked vehicles except on established roads, construction of roads, deposition of slash, and broadcast burning. Streamside Management Zones, however, provide limited protection to overall riparian function and habitat diversity to terrestrial species. By focusing dead and live tree retention within the first 50 feet of stream and by allowing smaller diameter trees to be retained (down to 8 inches DBH), SMZs could limit wood recruitment to streams, reduce habitat for foraging and breeding (less vegetation and smaller diameter snags retained), reduce hiding and brood rear-

ing habitat as well as limit effective wildlife movement corridors.

Mechanical treatments could potentially cause disturbance and short-term displacement of wildlife species depending on the type of equipment used as well as the size and location of treatment areas. Hand cutting and the use of horses for logging could have minimal disturbance and allow wildlife to remain in or near the area. Mechanical ground equipment, the use of chainsaws and helicopters would have a greater degree of disturbance and result in more displacement of wildlife. It is expected that use of the area would resume after project implementation but some species could permanently leave the area. The timing of treatments would be considered during project planning and project implementation during critical seasons of use (such as within big game winter range during winter) would be minimized or prohibited.

Both prescribed fire and mechanical treatments would remove vegetation and could disturb and displace wildlife with the effects ranging from minor to major and short-term to long-term based on timing, extent, and duration of a project. Often, mechanical treatments must be done to pre-treat a site for prescribed burning. Effects could be either beneficial or detrimental depending on the wildlife species impacted, goals of the project, size of project and timing of implementation.

Prescribed fire would restore, create, and improve habitat for wildlife dependant on post-fire forest habitats and would rejuvenate and enhance understory vegetation. Down woody material and snag habitat would also be increased from the use of prescribed fire. Grassland and shrubland species would benefit from the use of prescribed fire by reducing conifer encroachment and restoring forage and breeding habitats for a wide range of wildlife species.

Although grasses and certain forbs are rejuvenated and often quickly reestablished after prescribed fire, it could take two growing seasons or longer before shrubs, desired tree species and other forb species re-colonize a burn area. Mechanical treatments retain more desired vegetation for short-term recovery of a site but can cause a longer duration of disturbance than prescribed fire.

Naturally ignited wildland fires in the Elkhorn Mountains could be allowed to burn without aggressive fire suppression activities to improve vegetative conditions. Allowing wildland fires in the Elkhorn Mountains would restore larger areas in more remote locations than would be practicable or feasible with prescribed fire. Wildland fires could create more diversity of habitats due to the variability in their intensity. Wildfire often retains a mosaic of habitats as well as diversity of vegetation that may or may not be possible using prescribed fire.

Fire suppression activities would include the clearing of firelines, the maintenance of roads and the use of retardants. These activities would remove vegetation and habitat and would disturb and displace wildlife within these areas either temporarily or long-term depending on the type and extent of disturbance.

Permanent and temporary roads associated with management could increase public access and decrease the quantity and quality of wildlife habitat. Permanent and temporary roads could negatively impact wildlife habitat, particularly if roads are open during critical periods including winter and breeding seasons or during the hunting season in big game habitat. Roads can encourage the public to recreate in areas that had formerly been secluded. Roads can cause direct mortality through road kill, prevent wildlife movement, create disturbance, cause the spread of noxious weeds, and cause habitat fragmentation across the landscape.

Livestock grazing could reduce forage and cover available to wildlife. Managing grazing through the implementation of Standards for Rangeland Health and Guidelines would ensure that residual vegetation is maintained for foraging, breeding and cover habitat and reduce the risk of rangelands becoming degraded.

All alternatives would work to improve vegetation conditions and reduce the negative effects of livestock grazing on wildlife habitat for a variety of species. Maintaining sufficient forage and cover for wildlife on seasonal habitat would protect and benefit important wildlife habitat. Limiting water developments in areas where substantial conflicts for forage occurs between wildlife and livestock would ensure that the needs of wildlife are met.

Range improvement projects would improve range conditions over the long-term. Installing wildlife escape ramps in water tanks would prevent birds and small mammals from drowning in water tanks.

All new fences would be built to allow wildlife passage unless site-specific analysis identifies other objectives for a particular fence. Specifications for new or rebuilt fences would allow wildlife passage, especially for big game species.

Noxious weed management would have minimal negative impacts on wildlife but could provide substantial beneficial effects. Control of noxious weeds would improve wildlife habitat by protecting the diversity of native vegetation. Noxious weed infestations can reduce available forage to wildlife, degrade big game winter range, decrease the quality of riparian habitats, and reduce nesting, brood rearing, and hiding habitat for a variety of birds. Many noxious weeds are unpalatable to herbivores. While noxious weed control could temporarily disturb wildlife within treatment areas, the effects would be short-term. The long-term benefit of increasing the quality and quantity of wildlife habitat by reducing noxious weed infestations would outweigh any short-term disturbance.

Recreational activities could cause disturbance and displacement of wildlife species. However, the level of impacts would vary depending on the extent of activities and the wildlife species disturbed. Those recreational activities that occur during critical periods (i.e. nesting and brood rearing) and/or for long durations of time would have the greatest negative impacts on wildlife.

The management of Wilderness Study Areas (WSAs) would provide large blocks of undisturbed habitat, particularly for species that are sensitive to disturbance and have large home ranges. WSAs would also provide large blocks of habitat for connectivity and movement corridors for a wide range of species.

The Sleeping Giant ACEC provides important habitat for bighorn sheep, mountain goat, elk, bear, mule deer, mountain lion, as well as numerous migratory and resident bird species. One of the primary objectives of this ACEC is to preserve, protect and promote wildlife and habitat for "key" species including; elk, bighorn sheep, mountain goat, osprey, bald eagle, peregrine falcon, waterfowl, and cold water fish. Continued management of the Sleeping Giant ACEC would ensure that critical wildlife habitat for the above mentioned species would be maintained for the long-term.

Placing new communication sites at existing facilities would prevent loss of wildlife habitat as well as prevent additional disturbance to wildlife. In addition, the implementation of *Suggested Practices for Raptor Protection on Power Lines* (APLIC 1996) would ensure that impacts to birds and bats are being avoided. Implementation of wind energy guidelines as defined in the Wind Energy Development Programmatic EIS would minimize bird and bat mortality from turbines and associated infrastructure.

Under all alternatives, locatable minerals would be allowed to be explored and extracted. Exploration and extraction of minerals would result in disturbance and displacement of wildlife within the area of impact. During periods of active mining until restoration/reclamation is a completed, the area being mined would be unavailable as habitat for wildlife. Mining creates disturbance that would cause individuals to remain away from an area. Mining also causes a loss of habitat and reclamation activities may not be able to restore habitat to its original condition. The impacts to wildlife could include loss or fragmentation of habitat, loss of movement corridors and displacement of wildlife from critical winter or breeding ranges. Where there are priority species or their habitats, there may be special measures to prevent undue degradation during mineral and geophysical exploration. The degree of disturbance and habitat alteration from mining activities would vary depending on the size and extent of mineral extraction and could have minimal to major effects to wildlife and wildlife habitat with effects ranging from short to long-term.

After placer mining operations, reclamation activities would be required to restore stream channels and riparian habitat to functioning condition as close to pre-mine conditions as possible. Mining activities, placer operations in particular, could lead to a loss of riparian-wetland vegetation. All vegetation within the active mining area could be removed before and during mine development and operation. Vegetation immediately adjacent may be affected by roads, water diversions or other development. Riparian-wetland vegetation has a significant influence on certain stream types. Changes in the composition, vigor, and density of riparian vegetation can result in a loss of foraging, breeding, and hiding habitat for a wide variety of species as well as a loss in movement and travel corridors. The effects to wildlife from placer mining and mining in riparian areas could be substantial with long-term negative effects.

The reclamation and restoration of abandoned mine sites would provide cover and forage for wildlife and would improve water quality. Reclaimed areas often use non-native vegetation that is easily and quickly established. Often this non-native vegetation provides forage and cover for wildlife but does not provide the diversity of vegetation or the species that may have originally been located on the site.

Oil and gas exploration and development of surface and subsurface lands would comply with appropriate stipulations and term and conditions at the time of leasing. This would ensure that impacts to wildlife and wildlife habitat are considered and avoided, when possible. Habitat would be lost from drilling activity, wells, ponds, access roads, and pipelines. Wildlife species would be disturbed and displaced. The effects to wildlife could be minimal to major and short to long-term depending on the wildlife species found in an area and the extent of drilling activities.

There are approximately 652,194 acres of federal mineral estate lands potentially available for oil and gas exploration and development in the Decision Area. Actual acreages available vary based on proposed stipulations by alternative. In the Decision Area, five areas have been identified with the most potential for oil and gas exploration and development (low to moderate potential overall) where there would most likely be reasonably foreseeable development and drilling activity (**Appendix M**). The five areas are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. The total area within these five areas is roughly 116,295 acres. Each of the five areas ranges in size from 1,400 to 50,600 acres.

It is estimated that a total of 31 conventional oil and gas wells could be drilled, most likely within the five areas with the most potential over 15-20 years. Nineteen of these wells would be exploratory, with six of them being producers. The RFD assumes that there would be two additional step-out wells developed for each of the six producers, resulting in a total of 18 producing wells

overall. The RFD also assumes that seven of these producing wells would be on federal mineral estate with the remainder being non-federal. As many as 40 wells might be drilled for coal bed natural gas, most likely near Bozeman Pass. None of this activity is forecast to take place on federal mineral estate.

Under all alternatives, there would be five stipulations to lessen the effects of oil and gas development on wildlife (stipulations that effect special status species are described under "Special Status Species"). A No Surface Occupancy or No Lease stipulation would prevent the loss of breeding, foraging, security and migration habitats as well as prevent any type of disturbance associated with oil and gas development. The more acres within a NSO or NL stipulation, the more overall protection a wildlife species (as well as other species) would have from oil and gas development. When comparing alternatives, those with more acres in NSO or NL provide the least negative effects to wildlife.

Timing restrictions protect species during the crucial breeding season (such as bald eagles and sage grouse) and/or during the sensitive overwinter season (such as with sage grouse). As with NSO and NL stipulations, when comparing alternatives, the more acres within a timing restriction, the more a species would be protected from disturbance during crucial seasons of use. This should allow a species to reproduce and fledge young and/or increase the chance of surviving the winter season. This stipulation would only be applied during oil and gas exploration and habitat loss could still occur for those species with timing stipulations. Timing restrictions and surface use stipulations would vary by alternative.

Effects of Alternative A

Vegetation types within the Decision Area are represented by grassland, shrubland, dry forest, cool, wet forest and riparian. Dry forest is the most dominant forest type and represents 38 percent (115,000 acres) of the total available habitat. Currently, there are approximately 101,200 acres of high density, mature dry forest in the Decision Area. The SIMPPLLE model (**Appendix D**) suggests that historic dry forests were maintained in a more open condition due to frequent fires and would be represented by approximately 30,400 acres (low density stands). Historically, these forests would have open canopies with an understory of grasses, shrubs, and forbs and would be surrounded by large blocks of areas dominated by grasslands and shrublands.

Under Alternative A, approximately three percent (3,600 acres) of the mature, high density, dry ponderosa pine and Douglas-fir habitat and up to four percent (5,100 acres) of all densities and size classes of dry forest habitats could be restored within the Decision Area per decade. Restoration would thin dense forests to create open stands with an understory of grasses, forbs, and shrubs. While this would benefit those wildlife species dependent on mature dry forest, Alternative A would have the least impact on restoring this habitat type in comparison to Alternative B (14,750 acres per decade) and D (18,200 acres per decade) but would restore more acres than Alternative C (4,800 acres per decade).

Cool, moist forest comprises only about 7 percent (20,200 acres) of the total amount of available habitat in the Decision Area. This vegetation type is found primarily in the Big Hole and Upper Missouri watersheds. The SIMPPLLE model found this habitat type to be closer to the range of historic conditions than other habitat types in the Decision Area. This is most likely due to a longer interval between fire events in cool, moist forest types. Although the SIMPPLLE model suggested that this vegetation type was close to the historic range of natural variation, fewer acres of smaller diameter trees (seedling, sapling and pole size) were found during the modeling exercise than expected.

There are approximately 14,000 acres of mature, high density cool, moist forest compared to the estimated 8,000 acres suggested by the SIMPPLLE model as the historic average. Under Alternative A, approximately 2,400 acres of high density, cool, moist forest could be treated per decade (12 percent of total cool, moist forest). Treatments in cool, moist forests would create small openings and thin dense stands to increase the diversity of vegetation and habitat and increase available forage for small and large mammals (including big game) and migratory and resident birds. Alternative A would move cool, moist forest towards the range of natural variability but would treat fewer acres of this forest type in comparison to Alternatives B (3,750 acres per decade) and D (5,050 acres per decade) resulting in less diversity of habitat. However, there would be less short-term displacement of wildlife under this alternative compared to Alternatives B and D. Alternative A could treat up to 1,850 more acres per decade than Alternative C.

Alternative A provides no retention guidelines or recommendations for restoration of snag and down woody habitat. Alternative A allows dead or down trees of any size (with no restrictions within riparian habitats) to be gathered for firewood and would not have any restrictions on the size of timber salvage projects. Under Alternative A, snag habitat and down wood would decline more rapidly than under the action alternatives. Alternative A would reduce available nesting and foraging habitat for woodpeckers, raptors, owls and other migratory and resident birds, flying squirrels as well as reduce denning sites for bears and martens. Down wood is a crucial habitat component for amphibians and reptiles and would decline more under this alternative than under the action alternatives. This alternative could result in a decline of habitat for those species dependent upon dead and dying trees and could have major and long-term negative effects.

Grassland vegetation represents approximately 45 percent of the total habitat in the Decision Area. These areas provide critical big game winter range as well as important habitat for large and small mammals and a wide variety of migratory and resident birds. The loss of grassland habitat due to conifer encroachment is a serious concern in the Decision Area and approximately 37 percent of grasslands (50,000 acres) are experiencing a decline in quality and quantity due to encroachment. Using the SIMPPLLE model (**Appendix D**), it was estimated that the number of acres with conifer encroachment in both grasslands and shrublands would have historically been closer to 6,000 acres.

Under Alternative A, almost four percent (5,250 acres) of grasslands could be treated per decade to reduce conifer encroachment and improve winter range for big game and nesting habitat for resident and migratory birds. Alternative A could treat approximately 62 percent more grassland habitat than Alternative C, but would treat less habitat than Alternatives B or D (56 percent and 72 percent less, respectively).

Sagebrush shrublands represent roughly 7 percent of the total habitat within the Decision Area and provide crucial habitat for wintering and calving big game as well as habitat for sagebrush obligates. Alternative A would not provide management direction for treatment and restoration of shrublands, which would result in a decline in healthy sagebrush habitat and negatively impact sagebrush dependant species.

Under Alternative A, noxious weed infestations would continue to degrade range conditions and reduce available forage for big game and other large and small mammals. Within riparian areas, grasslands, and shrublands, weeds would continue to reduce the quality of nesting and brood rearing habitat for a variety of migratory and non-migratory birds. Assuming implementation of the high end of proposed weed treatment acreages by alternative, Alternative A would treat 30,000 fewer acres (per decade) than Alternative B, 18,000 fewer acres (per decade) than Alternative C and 41,000 fewer acres than Alternative D (per decade).

The implementation of the Streamside Management Zones would result in smaller areas of riparian habitat being protected for the benefit of riparian habitats than under Alternatives B and C but the same as under Alternative D. Smaller riparian management areas proposed under Alternatives A and D, along with the types and extent to management activities allowed in SMZs, could reduce forage, hiding cover, and breeding habitat for a wide range of species and reduce the size and quality of riparian movement corridors. The effects would be the same as described under "Effects Common to All Alternatives."

Under Alternative A, approximately 3,500 acres would be protected with SMZs. Of the 3,500 acres, 1,700 acres would be forested and 1,800 acres would be non-forested (same as Alternatives B and D). The Upper Missouri and Big Hole watersheds would have the most acreage in SMZs (1,700 and 900 acres, respectively).

Alternatives A and D would not utilize timing restrictions to protect breeding migratory and resident birds during prescribed burning or other vegetation treatments. Alternative B would prevent prescribed burns during the breeding season unless those projects have low potential to impact breeding birds. Alternative C would restrict prescribed burning and mechanical treatments during the breeding season unless those projects have low potential to impact breeding birds. Alternatives A and D could have more mortality to birds from project implementation compared to Alternatives B and C.

Timing restrictions on activities that may disrupt big game during critical periods, such as the breeding or winter seasons, would reduce displacement and disturbance of these species. These seasonal restrictions would generally protect and benefit: elk, mule deer, moose and bighorn sheep winter and spring range; elk, mule deer, and bighorn sheep calving range; and mountain goat winter and spring range. The timing restriction in big game winter and spring ranges would be one month less under Alternative A than under the action alternatives (see "Effects Common to Action Alternatives"). This would allow disturbance during critical times of year when animals have been weakened from the winter. Additional stress to these weakened animals could cause mortality.

Alternative A would actively target less than one percent (30 acres) per decade of riparian habitat for mechanical treatments of vegetation, the least amount of riparian habitat restoration in comparison to the action alternatives. Unlike the action alternatives, aspen would not be identified for restoration or protection under Alternative A. Although riparian restoration could occur through other projects or as a result of implementing Land Health Standards, only 30 additional acres of riparian restoration per decade would be expected under this alternative. This is 670 fewer acres than Alternative B, 170 fewer acres than Alternative C and 1,670 fewer acres than Alternative D. Although short-term impacts from disturbance would be lowest with Alternative A, the long-term benefits from restored habitat and vegetation diversity and composition would be less than under any of the action alternatives.

No routine maintenance or review of exclosures would be required under Alternative A which could lead to breach of exclosures by cattle and degradation of riparian habitat.

Approximately 5.5 miles of permanent roads per year could be constructed in association with forest management under Alternative A. This could substantially reduce habitat and increase the level of disturbance and displacement for many wildlife species. This would have the most negative impacts on species sensitive to distur-

bance. Although Alternatives B and D do not specify an upper limit on permanent roads that could be built, both alternatives would minimize permanent road construction and build fewer roads than Alternative A. Alternative C would not allow permanent road construction and would protect the greatest amount of habitat and the most species from the negative effects of roads.

Alternative A would have the greatest negative impacts to wildlife from permanent and temporary road construction and the effects would be the same as those described under "Effects Common to All Alternatives."

Livestock grazing would continue to occur on 273,000 acres with approximately 25,680 AUMs. This would be 8,000 acres more than Alternative B and 11,000 acres more than Alternative C, but the same acreage as Alternative D. Livestock grazing under Alternatives A and D could have more negative effects due to competition between livestock and big game for forage, spread of noxious weeds, decrease in quality and quantity of grassland/shrubland habitat and loss of riparian habitat than Alternatives B and C.

The newly acquired Indian Creek, McMaster, and Spokane allotments would be grazed under the same grazing regulations as other BLM allotments. These areas are predominantly grassland and the lack of management flexibility under Alternative A could cause an increase in competition for resources between big game species, especially elk, and livestock.

Alternatives A and D would protect bighorn sheep and bighorn sheep habitat by reducing risks associated with the commingling of domestic and bighorn sheep. The implementation of buffers between domestic sheep and goat allotments and bighorn sheep habitat up to 9 miles in width would reduce the potential for disease epidemics within bighorn sheep populations. Although Alternatives A and D would allow for a buffer of up to 9 miles, these alternatives would not have a minimum buffer width. These alternatives would not guarantee adequate separation between wild and domestic sheep to prevent disease transmission. Alternatives B and C would provide minimum buffer widths between wild and domestic sheep. Unlike the action alternatives, Alternative A would not provide specific guidance when using domestic sheep for weed control in occupied bighorn sheep habitat. This could allow for disease transmission to wild sheep during weed control activities.

Roads can impact big game species, especially during critical phases of their life cycle. Disturbance and displacement of big game species can increase stress and energy demands on animals during critical periods such as the winter, breeding or calving seasons and reduce survival, especially during the winter and spring months. Motorized use of roads can produce disturbance that prevents full utilization of available habitat. The loss in potential use of habitat can exceed 50 percent when open road densities exceed 2 mi/mi^2 (Christensen et. al. 1993). During the hunting season, the probability of bull elk survival in proximity to open roads is much lower than in areas away from roads. Road kill causes direct mortality of elk and major interstate freeways may act as movement barriers in some cases.

The implementation of the Montana Cooperative Elk Logging Study (Lyons et al. 1985) would assist in maintaining security habitat and limiting disturbance under Alternative A. However, the action alternatives would ensure specific direction for maintaining large blocks of security habitat.

Alternative A would continue management of the Sleeping Giant ACEC but would not propose any new ACECs. The effects from this ACEC would be the same as described under "Effects Common to All Alternatives."

Unlike the action alternatives, Alternative A would not designate Humbug Spires as an ACEC. Although Humbug Spires is currently a WSA, if Congress does not designate this area as a Wilderness, there would be no management direction for this unique and important area. The proposed ACEC designation under the action alternatives would ensure this area is would be protected for numerous wildlife species.

With the action alternatives, the proposed ACEC that could have the most substantial beneficial effects to a wide variety of species is the Elkhorn ACEC. Currently, this area is managed under a Memorandum of Understanding (MOU) between the State and Forest Service for wildlife and recreation. If, at some time in the future, the MOU is withdrawn, an ACEC designation would ensure that BLM lands within the Elkhorn Mountain Range would be managed for wildlife goals and objectives. Alternative A would not guarantee that the emphasis of management in the Elkhorn Mountains would be for wildlife.

The negative effects to wildlife from mineral operations would be minimized by implementation of BMP's, which mostly relate to water quality and soils. The effects from mineral operations and development would be the same as described under "Effects Common to All Alternatives." All alternatives would have five stipulations to lessen the effects of oil and gas development on wildlife (stipulations that affect special status species are described under "Special Status Species"). Under Alternative A, these stipulations would include No Lease (NL) and No Surface Occupancy (NSO) of state wildlife management units and timing restrictions in big game habitat.

The five areas with the most potential for oil and gas exploration and development are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. The total acreage within these five areas is roughly 116,295 acres. Each of the five areas range in size from 1,400 to 50,600 acres. The southern Deerlodge Valley area located north of Ana-

conda is approximately 8,700 acres of subsurface ownership with no BLM lands. There are no wildlife management areas within the subsurface ownership in this area. The majority of subsurface ownership is within big game winter and spring range that would be subject to a 12/1 to 5/15 timing restriction. There are no currently identified critical big game calving areas in this area. Approximately 2,000 acres in this area are identified as year-round habitat for bighorn sheep and would be protected by the same timing restriction as big game winter and spring range (12/1 to 5/15).

The Sleeping Giant area is located north of Helena and is approximately 47,000 total acres of subsurface and surface ownership with roughly 22,000 acres of BLM ownership. There are wildlife management areas on the subsurface ownership of this area and approximately 3,400 acres would be protected with a NSO restriction. The majority of subsurface ownership is within big game winter and spring range and would be protected with a 12/1 to 5/15 timing restriction. There are no currently identified critical big game calving areas in this area. Approximately 11,800 acres in this area are identified as year-round and core habitat for bighorn sheep and would be protected by the same timing restriction as big game winter and spring range (12/1 to 5/15).

The Canyon Ferry area is located in and around the town of Townsend and is the largest area of potential oil and gas development with approximately 51,000 acres of subsurface and surface ownership. Roughly, 35,000 acres of BLM lands (surface) have the potential for oil and gas development with the majority of the acres located in the National Guard Firing Range. There are wildlife management areas within this location and approximately 700 acres would be protected with a NSO restriction. The majority of subsurface ownership is within big game winter and spring range and would be protected with a 12/1 to 5/15 timing restriction. There are no currently identified critical big game calving areas in this area. Approximately 20,900 acres in the area are identified as year-round and core habitat for bighorn sheep and would be protected by the same timing restriction as big game winter and spring range (12/1 to 5/15).

The Bozeman area is located approximately 10 miles east of Bozeman and is approximately 1,400 acres of subsurface ownership. There are no BLM lands in this area. There are no wildlife management areas within the subsurface ownership of this area. The majority of subsurface ownership is within big game winter and spring range and would be protected with a 12/1 to 5/15 timing restriction. There are no currently identified critical big game calving areas in this area. The area does not provide habitat for bighorn sheep.

The Livingston area is located immediately east of the town of Livingston and is approximately 8,450 acres of subsurface and surface ownership. There are approximately 1,600 acres of BLM lands in this area. There are no wildlife management areas located in this area. The majority of subsurface ownership is within big game winter and spring range and would be protected with a 12/1 to 5/15 timing restriction. Approximately 300 acres are identified as critical big game calving range in this area that would be protected with a 5/1 to 6/30 timing restriction. The area does not provide habitat for bighorn sheep.

In the Decision Area, there would be 66,000 acres of wildlife management areas that would be protected with a NSO stipulation under Alternative A (**Table 4-8**). However, only two of the five areas with the most potential for oil and gas development have wildlife management areas (4,100 acres) that would be protected with the NSO stipulation.

Decision Area-wide, there would be 498,973 acres of big game winter and spring range that would have a 12/1 to 5/15 timing restriction under Alternative A. Of these acres, approximately 236,443 acres would be even more protected with overlapping NSO stipulations or No Lease areas, leaving about 262,530 acres being protected by the Timing Limitation stipulation. Roughly 20,000 acres would have a 5/1-6/30 timing restriction in big game calving habitat. All of the five areas with the most potential for oil and gas development (total of 106,447 acres) overlap with big game winter and spring range and a total of 99,550 acres would be protected with the 12/1 to 5/15 timing restriction. Of these 99,550 acres, approximately 47,390 acres would be overlapped with more protective NSO stipulations or No Lease areas, leaving about 52,160 acres with just the Timing Limitation stipulation. Critical calving habitat is currently only found in one area (Livingston) and approximately 300 acres would be protected by a 5/1 to 6/30 timing restriction.

Table 4-8
Acres Affected by Oil and Gas Wildlife Stipulations

Resource Stipulation	Decision Area (Acres)	Five High Potential Oil and Gas Areas (Acres)
Wildlife Management Areas	66,000	4,100
Big Game Spring/Winter Range	500,000	99,550
Big Game Calving Habitat	20,000	300
Bighorn Sheep Year-round Range	131,000	37,000
Bighorn Sheep Core Habitat	71,000	28,000

Decision Area-wide, there would be 131,279 acres of bighorn sheep year-round habitat (including core habitat) that would have a 12/1 to 5/15 timing restriction under Alternative A. Of these acres, approximately 67,341 acres would be even more protected with overlapping NSO stipulations or No Lease areas, leaving about 63,938 acres being protected by the Timing Limitation stipulation. Three of the five areas with the most potential for oil and gas development are within occupied bighorn sheep habitat and a total of about 37,000 acres would be protected with a 12/1 to 5/15 timing restriction. Of these 37,000 acres, approximately 18,243 acres would be overlapped with more protective NSO stipulations or No Lease areas, leaving about 18,757 acres with just the Timing Limitation stipulation. Almost all of the acres in bighorn sheep habitat are also within big game winter and spring range so the timing restriction of 12/1 to 5/15 would benefit both bighorn sheep as well as all other big game species.

Timing restrictions for big game winter and spring range would be the same under Alternatives A, B and D. Although timing restrictions would protect big game during oil and gas exploration, there would be no guarantee that these species would be protected during development and production. Also, timing restrictions would not prevent the loss of habitat. Alternative C is the only alternative that would prevent loss of habitat as well as prevent disturbances to big game species. In big game calving habitat and bighorn sheep year-round range, timing restrictions would be less restrictive under Alternative A than Alternative B. Alternative A, however, would provide more protection to big game species compared to Alternative D.

Effects Common to Action Alternatives

All federally listed and BLM sensitive species and their habitats would be considered "priority" species and "priority" habitats. Other priority species would include; big game, migratory birds and habitats such as caves, cliffs, snags and down wood, sagebrush, bitterbrush, and mountain mahogany. By designating these species and habitats as "priority", they would be given additional protection and consideration during project planning and implementation. Protection and maintenance of habitat would ensure wildlife species maintain viable and diverse populations and ensure short-term and long-term protection of wildlife species within the Decision Area. Protection of special habitat components such as caves and cliffs would maintain habitat for species such as bats and peregrine falcons.

Seasonal closures during the winter and breeding seasons in occupied special status bat habitat would limit disturbance and allow these species to conserve energy during critical times of their lifecycle. Disturbance of bat hibernacula could cause bats to flee and expend valuable energy during the winter and, possibly, lead to mortality. Disturbance of maternity colonies could cause young bats to fall and be at risk of predation. Installation of bat gates would protect bats from disturbance, displacement, and direct mortality.

Protection of wildlife linkage corridors would reduce isolation and improve gene flow and viability of many wildlife populations.

Disturbance associated with projects in big game habitat would be seasonally restricted under all action alternatives. Restrictions would protect big game winter and spring range from disturbance and conserve the animals' energy during this critical time period. Restrictions within big game calving range would reduce disturbance and displacement and increase calving success.

All programs would be designed and implemented to meet or move towards meeting Land Health Standards. This would allow the restoration or protection of wildlife habitat from activities associated with all resource management programs including but not limited to; vegetation management, livestock grazing, forestry, rights-of-way, and energy development.

Vegetation treatments would move towards mimicking natural disturbances. Mimicking natural disturbance regimes would ensure that the structure, processes, and composition of these communities are healthy, functioning, and capable of renewal. This would maintain, protect, and restore habitat components necessary for forage, cover, and breeding habitat for wildlife. In addition, the emphasis on old forest structure, snag management, and large diameter trees would protect, enhance, and restore habitat for those wildlife species dependent on old forest structure and cavities for nesting and denning.

Existing old structure forests would be retained and protected from land use actions, stand-replacing wildland fire, and epidemic levels of insects and disease. Management actions would allow the development and maintenance of stand structures that are relatively complex with highly variable tree densities, healthy and diverse understory composition, and abundant snags and down logs that are well distributed across the landscape. Habitat for species that are dependent on and utilize late and old structure forests would benefit from the maintenance, protection, and development of this community.

Restoration to achieve desired ecological conditions in grasslands and shrublands would be conducted with all action alternatives through prescribed burning, mechanical treatments, and other appropriate treatments. This would enhance and rejuvenate wildlife habitat for many species. Regeneration of decadent vegetation, reduction of conifers and improving vegetation diversity and composition would improve winter range for big game, nesting, and brood rearing habitat for migratory and resident birds, as well as forage and cover for small and large mammals. During treatments in grasslands and shrublands, all trees with old forest structure would be left standing to provide nesting and perch sites for raptors and other migratory and resident birds.

Alternatives B, C, and D would emphasize restoration and protection of sagebrush habitat and would maintain, to the extent possible, large patches of high quality sagebrush. These alternatives would also emphasize maintaining connections between sagebrush communities and enlarging the size of sagebrush patches in occupied or historic sage grouse habitat. This would protect sagebrush obligate species and increase habitat for these species.

Riparian areas would be managed to maintain or improve the distribution of large woody material and to provide habitat for a variety of small and large mammals, birds, bats, reptiles, and amphibians. Protection and restoration of riparian and wetland habitats would ensure that breeding, foraging and overwintering habitat as well as snags and down wood would be available for the wide variety of wildlife species dependent on this important habitat within the Decision Area. Protection, enhancement, and restoration of these areas would also ensure habitat is available for migratory or transient animals.

During project planning, the effects of roads (permanent and temporary) on wildlife and habitats would be considered. This would ensure that impacts to wildlife and wildlife habitat are minimized, when possible. These evaluations may determine that some pre-existing routes be closed or decommissioned. Closure and rehabilitation of roads within the Decision Area would reduce disturbance to wildlife and increase functional habitat.

Implementation of grazing utilization levels (not to exceed 55 percent non-native grasses and 45 percent native herbaceous plants) in grazing allotments that lack specific management objectives would maintain forage for wildlife, especially big game species. This would also help to prevent competition for forage between livestock and big game. Maintaining quality range conditions would ensure that adequate forage, cover and nesting and brood rearing habitat would be available for wildlife.

Prohibiting the use of domestic sheep and/or goats for weed control within occupied bighorn sheep habitat would reduce the transmission of diseases to bighorn populations.

Closing rock climbing in areas with active raptor nests would prevent these species from abandoning nest sites.

When MFWP determines that big game hunting season extensions are necessary to efficiently and effectively manage for big game populations, BLM may modify seasonal use restrictions on roads to allow access.

Where minimum-size blocks of security habitat (250 acres) are located, they would be retained in a suitable condition during project implementation. Larger blocks of security habitat would be addressed and analyzed during project or watershed level planning to address the protection of security habitat. Where security habitat is limited or fragmented across the landscape, the BLM would emphasize improving habitat through vegetation treatments and road closures (including seasonal closures) to increase security habitat for big game species.

High priority lands for retention and future acquisitions would include areas important to wildlife such as ACECs, Wild and Scenic River corridors, Wilderness, and habitat for priority and special status species. This would ensure long-term protection for numerous wildlife species.

All practical measures to maintain, protect, or minimize disturbances to natural resources would be taken during mining exploration. The effects on wildlife and wildlife habitats due to mining could be minor to substantial with long-term negative effects.

Effects of Alternative B

Dry forest of Douglas fir and ponderosa pine represent the most common forested habitat in the Decision Area. Management of dry forest (including prescribed fire and commercial and non-commercial treatments) would focus on moving this habitat type towards the range of historic conditions. The SIMPPLLE model suggested that this habitat has been severely altered from historic conditions due to fire suppression. The historic fire frequency in these habitat types would have maintained more acres with open canopies and a diversity of understory plants.

Under Alternative B, treatments in dry forests would improve habitat for those wildlife species dependent on mature, open stands by increasing breeding and foraging habitat and by increasing the diversity of vegetation structure and species. Projects would mimic natural fire events to create large mature trees with an open understory of grasses, shrubs, and forbs. Over the long-term, habitat for resident and migratory birds, raptors, and large and small mammals would be increased. Large diameter snag habitat would be allowed to become established, creating crucial habitat for snag dependent species.

Treatments in dry forest would encourage increased diameters of trees with a diversity of overstory and understory age classes. However, the density of trees would be reduced, sometimes substantially, to promote the growth of grasses, shrubs, and forbs. Under Alternative B, up to 14,750 acres (13 percent) of dry forest habitat (all size classes and densities) could be treated per decade to improve forest structure, density, and composition.

Treatments within dry forest habitat would be emphasized within the Upper Missouri, Jefferson, and Big Hole watersheds. The majority (47 percent) of the treated areas would occur within the Upper Missouri River watershed. Currently, there are approximately 34,000 acres of medium and large tree size, high density, dry Douglas-fir and ponderosa pine habitat within the

Upper Missouri River watershed compared to 7,000 acres estimated to be historically present. Proposed treatments could reduce the acreage of high density trees to approximately 29,000 acres in the first decade. After two decades approximately 24,000 acres would remain in a high density condition.

Treatment of up to 2,750 acres per decade of medium and large tree, high density dry forest in the Jefferson watershed could reduce current acreages from 19,200 acres to 16,450 acres in the first decade as compared to 4,900 acres historically present (based on the SIMPPLLE Model). After two decades, approximately 13,700 acres would remain in a high density condition. Proposed treatments of up to 1,850 acres per decade in the Big Hole watershed could reduce current acreages from 14,000 acres to 12,150 acres in the first decade compared to 7,000 acres historically present. After two decades, approximately 10,300 acres would remain in a high density condition.

The dry forest types are often used by big game species during winter months and reduction in tree densities would result in an increase of forage. However, reducing tree densities and creating open stands could increase the vulnerability of big game to hunting.

Management for mature, open, dry forests would increase habitat for a variety of resident and migratory birds, raptors, and owls. Although there would be long-term benefits to species that depend on open, dry forest stands such as flammulated owls, there could be a decline in the amount of habitat available for those species that prefer more dense forest types.

Additional impacts would occur from temporary road construction for forest treatments. Roads would reduce habitat and could potentially increase the level of disturbance and displacement of wildlife species in these areas. To reduce disturbance to wildlife, temporary roads would be closed within one year of project completion.

Over the long-term, management towards pre-fire suppression conditions would benefit the majority of species that utilize these vegetation communities.

Overall, Alternative B would move more acres towards the historic average and restore more habitats for wildlife dependant on dry forest types than Alternatives A and C, but less than Alternative D.

Cool, moist forest is the least available habitat type in the Decision Area and is predominately located in the Big Hole and Upper Missouri Watersheds. Under Alternative B, up to 3,350 acres of medium to large tree, high density, cool, moist forest could be treated per decade within the Decision Area. Up to 1,600 acres per decade could be treated in both the Big Hole and Upper Missouri watersheds in this habitat type. In the Upper Missouri, this could reduce mature, dense, cool forest stands from 6,000 acres to 4,400 acres in the first decade which would be close to the historic average (4,300 acres). In the Big Hole, the reduction could be from 5,500 acres to 3,900 acres in the first decade and to 2,300 acres within two decades, taking the number of acres near the historic average of 2,400.

The Jefferson, Blackfoot, Gallatin, and Yellowstone watersheds could have a small number of acres of mature, high tree density cool forest treated per decade; 50 acres in the Gallatin, 100 acres in the Yellowstone and Blackfoot and 300 acres in the Jefferson. The effects to wildlife from treatments in these watersheds would be minimal.

There would also be a small number of acres (200 acres per decade) treated in the Upper Missouri and Big Hole watersheds to thin seedlings and pole size cool forest habitats. This would have minor effects to wildlife.

Reduction of stem density and creating additional small openings would be beneficial to wildlife that occur in this vegetation community. The creation of small openings would increase vegetation and habitat diversity and available forage for big game and other species. Increased vegetation diversity and understory development would improve habitat for many small and large mammals and migratory and resident birds. Improvement of habitat for prey species would benefit large predators within cool, moist forests.

Alternative B would treat up to 3,750 acres per decade of cool, moist forest over all size classes, which would be less than Alternative D, but more than Alternatives A and C. Treatments would result in temporary displacement of wildlife within project areas to adjacent forest areas. However, displacement would be short-term and habitat would ultimately be improved by creating a diversity of vegetation species, size classes, and age classes. Additional impacts would occur from temporary road construction for forest treatments. Roads would reduce habitat and could potentially increase the level of disturbance and displacement of wildlife species in these areas.

The BLM would use an existing protocol developed by the USFS to determine the range of natural conditions for snag habitat until additional studies are completed. This would provide criteria for determining how much snag habitat should be retained (or created) in different habitat types and would aid in assessing impacts associated with management actions during project planning. Throughout the Decision Area, there are snag deficient areas due to historic mining, firewood cutting, and timber harvest. In these areas, snags would be targeted for creation. Within other forested stands of the Decision Area, snags have been created naturally through forest insects, disease, and fire.

Improvement in snag habitat management would benefit those species dependent on snags for breeding, foraging, and denning. The proactive creation of snags would increase snag habitat for snag dependant species over the long-term and improve species viability. In snag defi-

cient areas, Alternative B would proactively create more snag habitat than all other alternatives.

When timber salvage is proposed in dead and dying forests, Alternative B would provide direction to maintain contiguous acres of undisturbed standing and down woody material in adequate amounts for those wildlife species that depend on this habitat type. This would protect snag habitat for a variety of snag dependent species including migratory and resident birds, raptors, bats, and mammals.

Where salvage is allowed to occur, forest openings would be appropriate to the site and would also include retention patches. Selective thinning could occur between openings. Alternative B would ensure more habitat for those species that depend on dead and dying forests is maintained compared to Alternatives A and D but less than Alternative C.

Under Alternative B, only dead and dying trees would be allowed to be removed for firewood and no trees over 24 inches in diameter could be cut. However, BLM would have the flexibility to designate specific areas of live trees for firewood cutting in order to meet specific resource goals such as removing conifer encroachment in grasslands and shrublands. Retention of larger, dead trees would ensure that the largest, higher quality snags would be retained for those species dependent on snags for breeding, foraging, and cover. Larger diameter snags typically remain standing longer than smaller diameter snags so retention of larger snags would increase the number snags and improve the quality of snag habitat over the long-term.

Most firewood cutting occurs within 300 feet of roads but can have a substantial effect on the number of snags in an area. By allowing firewood cutting of snags up to 24 inches in diameter, many smaller snags that would still provide nest sites, cover, and forage for birds and mammals would be lost. Alternative B would protect more snags and down wood from firewood cutting than Alternative A but substantially less than Alternative C (firewood cutting would only be allowed in designated areas). Because most firewood cutting takes place near roads and Alternative B would have more miles of closed and seasonally restricted roads than Alternatives A and D, this alternative would have fewer areas of the forest affected from firewood cutting than Alternatives A and D but more than Alternative C.

Grasslands make up the majority of habitat in the Decision Area (45 percent) and conifer encroachment is causing a substantial decline in the quality and quantity of this habitat type. Although sagebrush shrubland is only found on 7 percent of the Decision Area, this habitat type provides essential habitat for sagebrush obligate species.

Treatments in grasslands and shrublands would move towards pre-fire suppression conditions and away from the effects of historic grazing to improve habitat for species that are dependent upon these vegetation communities. Conifer encroachment has reduced the amount and quality of breeding, brood rearing, foraging, and cover habitat for a wide range of wildlife species. Roughly 50,000 acres of grassland and 14,000 acres of shrublands are currently experiencing some level of conifer encroachment. The SIMPPLLE model predicted that an average of 6,000 acres of grasslands and shrublands within the Decision Area would be encroached historically. Alternative B would treat up to 11,800 acres (9 percent) of grasslands and 3,650 acres (18 percent) of shrublands per decade in the Decision Area with prescribed fire, mechanical treatments, and other appropriate methods to reduce conifer encroachment and improve the health and resiliency of these communities. Alternative B would restore more acres of grasslands and shrublands than Alternatives A and C but fewer than Alternative D. Although Alternative B would have short-term adverse effects from disturbance to wildlife, the long-term benefits from increased breeding, brood rearing, foraging and cover habitat would outweigh the short-term impacts. The loss of conifers could have negative effects to nesting migratory and resident birds but habitat for these species is not considered to be limited across the Decision Area.

Alternative B would treat grasslands and shrublands within all major watersheds but the watersheds with the largest number of acres treated would be the Big Hole, Jefferson, and Upper Missouri.

Overall, Alternative B would treat more acres to reduce noxious weeds than Alternatives A and C, but approximately 11,000 acres less than Alternative D. The effects would be the same as described under "Effects Common to All Alternatives."

Alternatives B and D would be the most proactive alternatives regarding restoration and protection of bitterbrush and mountain mahogany habitat. These communities are often important within big game winter range and restoration and protection of these communities would ensure long-term availability of high quality habitat for big game. A variety of other wildlife species, such as resident and migratory birds, would also benefit from the protection and restoration of this habitat type.

Under Alternative B, prescribed burns would be planned to protect 20 percent of above ground vegetation within treatment areas, providing desirable vegetation for colonization into the burn. Alternative C would retain more (40 percent) unburned vegetation during prescribed fire and Alternative D would retain less (10 percent).

Alternative B would reduce mortality to nesting birds, including migratory and resident birds, in areas treated with prescribed fire by excluding the use of fire during the breeding season in areas that have substantial use by breeding birds. However, because other methods of treatments would not have timing restrictions, there could be impacts to breeding birds from mechanical

treatments during the breeding season. Alternative B would protect breeding birds and prevent more mortality than Alternatives A and D but less than Alternative C.

Riparian areas support a higher diversity of plants and animals than non-riparian land. This is a result of the wider range of habitats and foods available as well as the proximity to water, microclimate, and refuge. Many native plants are found only, or primarily found, in riparian areas and these areas are essential to many animals for all or part of their lifecycle. Riparian areas also provide refuge for native plants and animals in times of stress, such as drought or fire, and play a large role in providing corridors for wildlife movement.

The limited amount of riparian habitat in the Decision Area and the substantial use these areas receive by wildlife, makes this habitat type the most crucial to restore or protect.

Riparian Management Zones (RMZs) would be established for this alternative that are wider than SMZs under Alternatives A and D, but narrower than RMZs under Alternative C. Whereas SMZs under Alternatives A and D only protect streams and riparian habitats from timber harvest, RMZs would provide overall riparian management objectives. These zones would differ in width by forested and non-forested habitat, stream type (fish-bearing, perennial or intermittent) and range from 50 feet (intermittent streams) to approximately 160 feet for fish-bearing streams (based on the height of two site potential trees) on either side of the stream. A site potential tree in the Decision Area is considered to have an average height of 80 feet. Riparian Management Zones would provide more protection for terrestrial wildlife than SMZs alone by restricting all management activities in larger areas adjacent to streams and by requiring management activities to restore or maintain riparian and stream function. These wider RMZs would ensure that riparian habitat is maintained along streams not only for water quality and aquatic habitat but also for the numerous terrestrial wildlife species that use riparian areas for breeding, foraging and hiding habitat as well as for movement corridors.

Under Alternative B, approximately 5,300 acres would be managed with the emphasis on protecting, restoring, or maintaining riparian areas in RMZs. Of the 5,300 acres, 3,507 acres would be forested and 1,800 acres would be non-forested. The Upper Missouri and Big Hole watersheds would have the most acreage in Riparian Management Zones (2,330 and 1,440 acres, respectively).

Alternative B would allow management in RMZs to restore, enhance, or protect aquatic and riparian communities. There would be fewer negative effects from a loss of large woody material, desired vegetation or movement corridors under Alternative B than with Alternatives A and D. Since Alternative C extends RMZs further from streams, riparian habitat and movement corridors would be the widest and most protected under this alternative.

Under Alternative B, up to 700 acres of riparian vegetation could be mechanically treated per decade with 200 acres in the Upper Missouri watershed, 200 acres in the Jefferson watershed, 200 acres in the Big Hole watershed, 50 acres in the Yellowstone watershed, 40 acres in the Blackfoot watershed and 10 acres in the Gallatin watershed. The 700 acres proposed with Alternative B would be treated as "stand alone" projects. Additional riparian areas could be improved through other vegetation treatment projects. The objectives, however, would be the same whenever projects occur in riparian areas. Unless a project is necessary for human safety or has unavoidable adverse affects as with mineral extraction, projects would be done to restore or protect riparian habitats.

Protection and active restoration of riparian areas would maintain and/or enhance breeding, brood rearing, foraging, travel, and hiding cover for migratory and resident birds (including raptors and owls) and small and large mammals as well as habitat for amphibians and reptiles. Restoration and protection of riparian areas would improve habitat for beavers that would in turn increase the width of riparian areas (by damming streams) and provide high quality foraging and breeding habitat for a variety of species. Habitat connectivity would be improved, fragmentation would be reduced, and travel corridors would be ensured for a multitude of species.

Unlike Alternative A, Alternatives B and D would actively restore aspen stands to improve and expand habitat for wildlife. Nesting habitat for birds, including migratory birds, would be increased and so would an important winter food source for elk, deer, and moose.

Timber harvest and removal of products would be allowed during riparian restoration under Alternative B but only if riparian objectives are met. When necessary, some temporary roads may be allowed to access riparian areas but would only be allowed if they do not damage riparian vegetation, soils, or streams or negatively impact riparian or aquatic functions. Restoration of riparian habitats would rejuvenate riparian vegetation, encourage multiple age classes, and expand the diversity of native vegetation.

Alternative B would actively restore more acres of riparian habitat than Alternatives A and C but less than Alternative D. Active restoration activities could have minor and short-term effects from disturbance and minor soil erosion but would have long-term beneficial effects from an increase in diversity and vigor of riparian vegetation as well as an increase in habitat structure. Since many riparian areas have existing open roads, some restoration activities could decrease the amount of hiding or security cover for big game. When possible, the loss of hiding and security cover would be minimized during project development.

Although RMZs would be identified to protect and improve riparian function, firewood cutting would still be allowed within some RMZs. Down wood and snags would be protected from firewood cutting within 100 feet for perennial and 50 feet for intermittent streams. This would ensure that a certain amount of riparian habitat is protected from firewood cutting. However, disturbance and removal of habitat from firewood cutting within the outer 60 feet of the RMZ boundaries (perennial streams) would be allowed. This would reduce the quantity of available snag and down wood habitat in these areas.

Alternatives B and D would provide more protection of snag habitat in riparian areas from firewood cutting compared to Alternative A but would provide less protection than Alternative C.

Under Alternative B, there would be a schedule for exclosure maintenance but there would be no guarantee that exclosures would be in a functioning condition before livestock turn-out. This could result in damage and degradation of riparian areas, springs, and unique habitats. There would be no substantial differences in acres grazed by livestock between all alternatives. Alternative B would decrease the acres of livestock grazing proposed under Alternatives A and D by 8,000 acres but would increase the number proposed under Alternative C by 3,000 acres. Designation of McMasters Hills, Indian Creek, and Spokane Hills as forage reserve areas would assist in improving range condition and meeting Land Health Standards by allowing other allotments to be rested during and after restoration activities (prescribed fire, etc.). The McMasters Hills and Spokane Hills allotments are primarily bluebunch wheatgrass (approximately 70 percent) and provide big game winter range. The Indian Creek allotment provides a diversity of habitats but also provides important big game winter range as well as crucial habitat for bighorn sheep.

Unlike Alternatives A and D, Alternative B would require a minimum buffer width of 5 miles between wild and domestic sheep populations to reduce the potential for diseases, such as pasteurella, scabies and parasites from being passed from domestic to bighorn sheep. New sheep or goat allotments would not be allowed in occupied bighorn sheep habitat to protect wild sheep from disease transmission.

Alternative B would ensure that interactions between bighorn sheep and domestic sheep being used for weed control are kept to a minimum. Seasonal restrictions and buffers would ensure that domestic sheep and wild sheep do not use the same areas within the same time period. Alternative B would protect bighorn sheep more than Alternatives A and D through the use of a mandatory minimum buffer width but less than Alternative C (mandatory buffer width would be larger under Alternative C).

Although Alternative B would keep new permanent road construction to a minimum, new roads could result in disturbance and loss of habitats for numerous wildlife species including a loss of big game security habitat. Alternative B would have more negative effects from new road construction than Alternative C (which doesn't allow any new road construction) but less than Alternatives A and D.

To minimize disturbance to wildlife and loss of habitat, temporary roads would be kept to a minimum and closed within 1 year of project implementation. This would be similar to the other action alternatives although temporary roads could remain open longer under Alternative D.

Alternative B would also provide protection to big game by allowing no net increase in permanent roads in areas where open road densities are 1 mi/mi^2 or less in big game winter and calving ranges. Christensen et al. (1993) found that open road densities greater than 1 mi/mi^2 substantially lowered the use of habitat by elk. Alternative B would ensure that high quality winter and calving areas remain available to big game. Under Alternative B, BLM would also focus on reducing open road densities in big game winter and calving ranges where they exceed 1mi/mi^2. Alternative B would ensure more functional habitat is available to elk and other big game species compared to Alternative A and D which would allow higher road densities in elk habitat. This alternative, however, would provide less function habitat for elk than Alternative C.

There would be two proposed ACECs common to all the action alternatives, Sleeping Giant and Humbug Spires. Alternative B would propose two additional ACECs (Elkhorn Mountains and Ringing Rocks). The Ringing Rocks ACEC would be small (160 acres) and would have minimal beneficial effects to wildlife. Humbug Spires is currently a Wilderness Study Area. If Congress does not designate the Humbug Spires WSA as Wilderness, the proposed ACEC designation would ensure a certain measure of continued protection of this area for those species that depend on dry forest, rocky outcrops, and riparian habitats.

The proposed ACEC that would have the most substantial beneficial effects to a wide variety of species is the Elkhorns ACEC. Currently, this area is managed under a Memorandum of Understanding (MOU) between MFWP, USFS, and BLM for wildlife and recreation. If, at some time in the future, the MOU is withdrawn, the ACEC designation would ensure that BLM lands within the Elkhorn Mountain Range would be managed to support populations of wildlife species associated with endemic vegetative communities and that management would focus on wildlife goals and objectives. The ACEC would also ensure that long-term management goals and objectives in the Elkhorn Mountains would be for wildlife and wildlife habitat.

The potential Elkhorns ACEC would consist of approximately 50,431 acres in and around the Elkhorn Mountains but would exclude the Limestone Hills National Guard Training Area, Radersburg motorized play area and several small isolated parcels along the western boundary. Management activities under the proposed ACEC would have long-term benefits to wildlife by focusing management specifically for wildlife. Substantially more acres would be proposed under this alternative than Alternative D which would only encompass the existing Tack-on WSA boundary (3,575 acres).

Unlike Alternatives A and D, Alternative B would guarantee long-term protection of wildlife habitat in the Elkhorn Mountain Range if the MOU is withdrawn. Under Alternative C, the Elkhorn ACEC would include all BLM lands in the Elkhorn Mountains (67,665 acres).

Alternatives B and C would implement food storage regulations at all recreation sites with high potential or known encounters between bears and people. This would protect bears from being destroyed or moved. Alternatives A and D would not provide for any food storage restrictions to protect bears.

During mining activity, road construction would be kept to a minimum and roads and facilities would be closed and rehabilitated after mining is finalized. Alternative B could protect wildlife habitat from the effects of mining to a greater degree than Alternatives A and D but less than Alternative C. However, the effects from mineral extraction could have minor to major and long-term effects to wildlife as described under "Effects Common to All Alternatives."

All alternatives would have five stipulations to lessen the effects of oil and gas development on wildlife (stipulations that effect special status species are described under "Special Status Species"). Under Alternative B, these stipulations would include No Surface Occupancy (NSO) in state wildlife management units and bighorn sheep core areas and timing restrictions in big game habitat, including bighorn sheep year-round range.

The acres of available habitat would be the same for each alternative (**Table 4-8**) but the type of stipulations would vary between alternatives.

The stipulation for wildlife management areas would be similar under Alternatives A, B and D but under Alternative A, there would be "core" areas surrounding the wildlife management unit that would have the most restrictive stipulation of No Lease (NL). With a proposed NSO stipulation under Alternatives B and D and a NL stipulation under Alternative C, there would be minimal differences in effects between the action alternatives. All alternatives would protect habitat within wildlife management areas from oil and gas exploration and development.

Alternative B would have the same timing restriction on oil and gas exploration as Alternatives A and D for big game winter and spring range (12/1-5/15). Under Alternative B, of the 498,973 acres of big game winter and spring range, approximately 248,213 of these acres would be even more protected with overlapping NSO stipulations or No Lease areas; approximately 11,770 more acres than under Alternative A. Of the 99,550 acres of big game winter/spring range within the five areas most likely to have oil and gas development, about 42,217 acres (5,173 fewer than under Alternative A) would be even more protected by overlapping NSO stipulations or No Lease areas under Alternative B. Although Alternatives A, B and D would protect overwintering big game from disturbance, Alternative C would provide the greatest amount of protection to big game from both disturbance and loss of habitat.

Alternative B would increase the timing restriction in big game calving habitat by one month in the spring over Alternatives A and D to 4/1-6/30. This would provide areas free of disturbance to individuals that may give birth early and would provide refuge to big game before they give birth. Alternative B would provide less protection than Alternative C which would prevent disturbance to big game as well as prevent loss of habitat from oil and gas development.

Alternatives B and D would increase the timing restriction for oil and gas exploration in year-round bighorn sheep habitat by two months to 11/1-6/30 compared to Alternative A. This would provide more refuge for sheep during lambing (most lambing occurs between April and June with some lambing occurring in early July) and going into the difficult winter season. Of the 131,279 acres of bighorn sheep year-round habitat, approximately 91,126 acres (23,695 more than under Alternative A) would be even more protected with overlapping NSO stipulations or No Lease areas, leaving about 40,153 acres being protected by the Timing Limitation stipulation. Of the approximately 37,000 acres of bighorn sheep habitat within the five areas most likely to have oil and gas exploration and development, 30,025 acres (11,782 more than under Alternative A) would be overlapped with more protective NSO stipulations or No Lease areas, leaving about 6,975 acres protected by the Timing Limitation stipulation. Alternative B would provide less protection than Alternative C which would prevent disturbance to bighorn sheep as well as prevent loss of habitat from oil and gas development.

Alternative B would restrict use in bighorn sheep core habitat over Alternatives A and D during oil and gas exploration and development by implementing a NSO. This would protect crucial habitat for bighorn sheep from disturbance as well as from loss of habitat. Alternative B would have similar beneficial effects as Alternative C (NL) on bighorn sheep in their core habitats.

Under Alternative B, the riparian habitat along Muskrat Creek would not be protected from mineral development. This could result in the fragmentation and loss of

crucial riparian habitat along Muskrat and Nursery Creeks.

Effects of Alternative C

Alternative C would focus more on "passive" restoration of habitats and would treat the least amount of dry forest habitat in comparison to the other alternatives (up to 4,800 acres per decade of all size classes and densities).

Treatments would only be proposed in the three major watersheds, Big Hole, Jefferson, and Missouri but the majority of treatments would occur in the Missouri River watershed.

Currently, there are approximately 34,000 acres of medium and large tree size, high density, dry Douglas-fir and ponderosa pine habitat within the Missouri River watershed compared to 7,000 acres estimated to be historically present. Proposed treatments under this alternative could reduce the acreage of high density trees to approximately 32,000 acres in the first decade. After two decades approximately 29,000 acres would remain in a high density condition. This would be substantially fewer acres restored to historic conditions than with all other alternatives. Under Alternative C, mature, high density ponderosa pine would only be treated in the Missouri River watershed.

Approximately 1,250 acres of mature, high tree density dry forest in the Jefferson watershed would be treated per decade. Treatments would reduce the current acreages from 19,000 acres to 17,750 acres in the first decade and down to as low as 16,500 over two decades. This would be well above the historic average of 4,900 acres. Proposed treatments of 500 acres per decade in the Big Hole watershed would reduce current acreages from 14,000 acres to 13,500 acres over a decade and down to as low as 13,000 after two decades, which would also be well above the historic average of 7,000 acres.

Alternative C would restore the fewest acres of habitat for those wildlife species dependent on mature, open stands of Douglas fir and ponderosa pine of all alternatives. Alternative C would treat substantially fewer acres compared to Alternatives B and D with up to approximately 10,000 acres per decade less than Alternative B, and up to approximately 13,000 fewer acres per decade than Alternative D. Alternatives A and C would treat a similar amount of acres. Dry forest makes up roughly 38 percent of all vegetative communities in the Decision Area. This community was found to be severely altered and degraded due to fire suppression and Alternative C would move the fewest acres towards the natural range of conditions. Under Alternative C, more acres of dry forest types would be in an undesirable condition for the wildlife species dependant on this habitat type. However, Alternative C would have the fewest negative effects from disturbance to wildlife from treatments in dry forest habitat.

Alternative C would restore a relatively small amount of mature cool, moist forest and would treat the least amount of this habitat type compared to the other alternatives (approximately 550 acres per decade in four watersheds, Big Hole, Upper Missouri, Jefferson, and Yellowstone). Since cool, moist forest was not found to be substantially out of the range of historic conditions with the SIMPPLLE model and may not be out of the historic range due to longer periods between fires in this habitat type, restoration of cool, moist forest is less crucial. Treatments would increase habitat diversity but Alternative C would have a minor effect, either beneficial or detrimental, to this habitat type and the species dependant on cool, moist forest.

Determining the range of natural conditions for snag habitat would be the same as Alternative B. However, the creation of snags would only be done opportunistically through other projects, when possible. Snags would be protected but not necessarily created in areas where they are lacking like under Alternative B. Due to a lack of vegetation treatments and active snag management, Alternative C could create less snag habitat in snag deficient areas over the long-term than Alternative B, but would be similar in effects to snag deficient areas as Alternatives A and D. Alternative C, however, would protect more acres of existing snag habitat created by insect, disease or fire than all other alternatives.

Since Alternative C would not allow dead and down wood to be taken as firewood and live trees could only be removed for firewood in authorized areas to meet resource objectives (such as the removal of conifer encroachment), this alternative would protect more snag and down wood habitat compared to all other alternatives. This approach would benefit species dependent on snags for foraging and nesting and would protect down wood for microsites, amphibians, reptiles, birds and small mammals.

Whereas Alternative B would not specifically identify the acres of dead and dying forest that would be retained during timber salvage, Alternative C would require 50 percent of dead and dying forest be retained in stands that exceed 1,000 acres (unless human safety is an issue). Although both Alternatives B and C would protect dead and dying forests, Alternative C would better guarantee the protection of moderate to large blocks of dead and dying forests. Connectivity and diversity of habitat as well as species productivity could be greatest for those species dependent on snag habitat under Alternative C than with Alternative B. Alternative D would also require a minimum patch size be retained for dead and dying forest but would only require 30 percent of an area be retained when dead forest stands exceed 1,000 acres. Alternative C would provide substantially larger blocks of snag habitat compared to Alternatives A or D.

Grasslands make up the majority of the vegetative communities in the Decision Area (45 percent) and are experiencing a serious decline in quantity and quality due to

conifer encroachment. Although sagebrush shrublands are only found in 7 percent of the Decision Area, this habitat type provides essential habitat for sagebrush obligate species.

Alternative C would treat and restore 2,000 acres of grassland (1 percent of total) per decade and 750 (4 percent of total) acres of shrubland per decade within three watersheds, Missouri, Jefferson, and the Big Hole. There are approximately 50,000 acres of grassland and 14,000 acres of sagebrush currently experiencing some level of conifer encroachment compared to the historic average of 6,000 acres in both grassland and shrubland communities.

Alternative C would treat fewer acres of grasslands and shrublands of all alternatives. Alternative C would have a minor effect on restoring grasslands and shrublands in the Decision Area and would only reduce the amount of conifer encroachment to 48,000 acres in grasslands and up to approximately 13,500 acres in sagebrush in the first decade. Most of the conifer encroachment in grassland occurs in the Missouri watershed while most of the encroachment in sagebrush occurs in the Big Hole watershed. Alternative C would treat the least amount of grassland and sagebrush than any of the action alternatives and would have the most detrimental effects to wildlife by allowing a continued decline in nesting, breeding and foraging habitat for a wide variety of species. The short-term adverse effects from project implementation would be less under Alternative C compared to all other alternatives.

Alternative C would have the least aggressive weed management of the action alternatives. Because this alternative would treat fewer acres of weeds than the other action alternatives, there would be more loss of wildlife habitat, especial foraging, nesting, and breeding habitat due to weed infestations. However, habitat conditions would improve with this alternative over Alternative A.

Aerial spraying for herbicides would not occur under Alternative C and this would prevent the potential inadvertent loss of important habitat such as sagebrush and mountain mahogany as well as the loss of important forbs. The lack of aerial spraying could decrease the ability of the BLM to control large weed infestations or infestations in remote areas or in rough terrain that could be difficult to reach by vehicle or on foot. The restriction on aerial spraying could cause an increase in the size and extent of weed infestations in the Decision Area and, ultimately, cause a decline or loss of wildlife habitat.

Unlike Alternatives B and D, bitterbrush and mountain mahogany habitat would not be proactively restored under Alternative C. These habitat types could be treated opportunistically with other projects but it is expected that fewer acres of these vegetative communities would be restored or maintained with Alternative C than under the other action alternatives.

Alternative C would retain the greatest amount of unburned above ground vegetation during prescribed fire treatments (40 percent). This would allow recovery of foraging, nesting, and hiding cover more quickly than the other alternatives. However, Alternative C would restore fewer acres because each treatment area would be required to retain a higher percent of above ground vegetation than under the other action alternatives. This could include undesirable species such as conifers in grasslands and shrublands.

Compared to the other alternatives, Alternative C would provide the greatest amount of protection to nesting birds, including migratory birds, by restricting both mechanical methods and prescribed burning during the breeding season. This would prevent mortality to migratory and resident birds during the breeding season.

Riparian Management Zones established for this alternative would be wider than under all other alternatives. A 300-foot RMZ for fish bearing streams and a 150-foot zone for non-fish bearing streams would be implemented under Alternative C. As with the other alternatives, the RMZs could have management activities.

Unlike Alternatives A and D, Alternatives C and B would only allow management within riparian areas that protect, enhance or restore the riparian area and meet riparian objectives. Unlike Alternative B, under Alternative C trees could not be removed from the RMZ during restoration unless they would be used for other restoration activities (i.e. instream restoration or erosion control). This would ensure that not only would riparian goals and objectives be met with all projects (unless for human safety) but that any excess material generated from projects would be used for other restoration activities.

Alternative C would establish the most acres of all alternatives where the emphasis would be to restore, protect or enhance riparian habitat for aquatic species and terrestrial species that use the riparian zones adjacent to streams, wetlands and lakes for part or all of the their lifecycle. Under Alternative C, approximately 11,393 acres would be managed for riparian objectives of which 6,657 acres would be forested and 4,736 acres would be non-forested. Alternative C would have approximately 8,000 more acres proposed for riparian management than Alternatives A and D and approximately 6,000 acres more than Alternative B.

Alternative C would provide the best protection to all species which use riparian zones and the increased RMZ width would ensure that critical movement corridors are maintained for numerous wildlife species. Whereas the other alternatives focus more on the direct effects of riparian management to streams, Alternative C best considers the overall need of riparian areas to wildlife and as travel corridors for a wide range of species.

Although riparian treatments could occur with other projects, Alternative C would only actively target up to

200 acres of riparian vegetation per decade with 100 acres in the Missouri watershed, 50 acres in the Jefferson watershed, and 50 acres in the.Big Hole watershed. Alternative C would take a more "passive" approach to riparian restoration and would actively restore the fewest acres of any action alternative. However, this alternative would treat more riparian acres than Alternative A. Alternative C would also have less active restoration of aspen stands than Alternative B or D leading to a decline of this unique and valuable vegetative community.

Although RMZs would be identified to protect riparian areas, firewood cutting could be authorized within some RMZs under Alternative C if it meets other resource objectives. Because firewood cutting would only be allowed in authorized areas to meet resource objectives, habitat would be improved or maintained with this alternative and there would only be minimal negative effects to wildlife.

Unlike all other alternatives, Alternative C would ensure existing exclosures are maintained annually and maintained before livestock turn-out. This is the only alternative that provides adequate protection to aquatic and riparian habitats, springs, and other unique and fragile habitats from livestock use. Although a maintenance schedule would be provided under the other action alternatives, livestock turn-out could still occur before functional exclosures are in place. Unlike the other action alternatives, Alternative C would ensure that fragile and high value natural resources are protected. There would be no substantial differences in acres grazed by livestock between alternatives. However, with Alternative C, livestock grazing would be allowed on the fewest acres of all alternatives (3,000 acres less than Alternative B and 11,000 less than Alternatives A and D). This alternative would have the least detrimental effects on wildlife from livestock grazing, such as competition for forage, of all alternatives. Unlike Alternatives A and D, the Indian Creek allotment would be unavailable to grazing and unlike Alternative B, this allotment would be unavailable as a forage reserve.

Alternative C would require the largest mandatory buffer, 9 miles, between occupied bighorn sheep habitat and domestic sheep and goats. Alternative C would also provide the greatest protection to bighorn sheep when goats and sheep are used during weed control. This alternative would reduce the risk of disease transmission from domestic to wild sheep more than any other alternative.

Since forest treatments would only be allowed in areas that are already accessible by the current road system, Alternative C would have the fewest negative effects to wildlife from permanent road construction of all alternatives. As with Alternative B, temporary roads would be kept to a minimum and closed within 1 year of project implementation. With fewer proposed acres of treatment, Alternative C would require the fewest miles of temporary road for projects and would have the fewest road-related impacts on wildlife from roads of all alternatives.

Alternative C would provide the greatest protection to big game winter/calving range from the effects of open roads (described under "Common to All Alternatives" and "Effects of Alternative A") by allowing no net increase in permanent roads where open road densities are 1.5 mi/mi^2 or less in big game winter range. Alternative C would also improve the quality and quantity of big game winter range more than any other alternative by managing to reduce open road densities where they exceed 0.5 mi/mi^2. Christensen et al. (1993) found that reducing open road miles to less than 0.5 mi/mi^2 increases the amount of functional elk habitat by over 70 percent.

There would be two proposed ACECs common to all the action alternatives, Sleeping Giant and Humbug Spires.

Alternative C would propose three additional ACECs (Elkhorns, Spokane Creek, and Ringing Rocks). Both Spokane Creek and Ringing Rocks would be small (14 and 160 acres, respectively) and would have minimal beneficial effects to wildlife. Humbug Spires is currently a Wilderness Study Area. If Congress does not designate the Humbug Spires WSA as Wilderness, the proposed ACEC designation would ensure a certain measure of continued protection of this area for those species that depend on dry forest, rocky outcrops, and riparian habitats.

The proposed ACEC that would have the most substantial beneficial effect to a wide variety of species is the Elkhorns ACEC. Currently, this area is managed under a Memorandum of Understanding (MOU) between MFWP, USFS, and BLM for wildlife and recreation. If, at some time in the future, the MOU is withdrawn, the ACEC designation would ensure that the management emphasis of BLM lands within the Elkhorn Mountain Range would be to support populations of wildlife species associated with endemic vegetative communities and that management would focus on wildlife goals and objectives.

The potential Elkhorns ACEC would consist of all BLM lands in and around the Elkhorn Mountains (approximately 67,665 acres). The ACEC would provide long-term benefits to wildlife by focusing management specifically for wildlife. Substantially more acres would be proposed under this alternative than Alternative D which would only encompass the existing Tack-on WSA boundary (3,575 acres). Alternative C would have approximately 17,200 more acres in the Elkhorn ACEC than Alternative B.

Alternatives C and B would implement food storage regulations at all recreation sites with high potential or known encounters between bears and people. This would protect bears from being destroyed or moved. Alternatives A and D would not provide for any food storage restrictions.

Under Alternative C, no new structures or roads would be allowed in riparian management zones during new or existing mineral operations. This would provide more protection from mining activities of all other alternatives.

All alternatives would have five stipulations to lessen the effects of oil and gas development on wildlife (stipulations that affect special status species are described under "Special Status Species"). Alternative C would have a NL stipulation for state wildlife management units, big game winter and spring range, and bighorn sheep habitat.

Unlike the other alternatives, Alternative C would prevent any type of disturbance or loss of habitat from oil and gas exploration and development in big game habitat. This alternative would be the most protective to big game species.

Unlike all other alternatives, Alternative C would have a 180-acre mineral withdrawal along Muskrat and Nursery Creeks. This would ensure crucial riparian habitat along Muskrat and Nursery Creeks is provided long-term protection for resident and migratory species.

Effects of Alternative D

Alternative D would benefit a variety of wildlife species by actively restoring habitat that is vital to many species. Vegetation treatments would encourage growth and diversity of habitats and result in multi-age class communities.

Alternative D would take the most aggressive approach in actively restoring all habitat types in the Decision Area.

Dry forest of Douglas fir and ponderosa pine represent the most common forested habitat in the Decision Area. Management of dry forest would focus on moving this habitat type towards the range of historic conditions. The SIMPPLLE model suggested that this habitat type has been severely altered from historic conditions due to fire suppression.

Under Alternative D, projects would mimic natural fire events to create large, mature trees with open canopies and a diverse understory of grasses, shrubs, and forbs. Over the long-term, habitat for resident and migratory birds and large and small mammals would be increased. Large diameter snag habitat would be allowed to become established, creating crucial habitat for snag dependent species. Creation of open stands would ultimately result in increased breeding, foraging and hiding habitat for a wide range of species.

Treatments in dry forest would encourage increased diameters of trees with a diversity of understory age classes. However, the density of trees would be reduced, sometimes substantially, to promote the growth of grasses, shrubs, and forbs. This could have a negative effect on some species. For example, thinning dense stands of dry forest could result in a loss of hiding habitat for big game, making them more vulnerable to hunting or predation. However, thinning would also result in an increase in forage for these species. Site specific analysis would identify the effects to wildlife impacted by forest treatments.

Under Alternative D, up to 18,200 acres of habitat could be treated per decade within dry forest types of all sizes and densities which would alter forest structure, density, and composition more than under any other alternative.

Dry forest treatments could occur in the six watersheds of the Decision Area but there would be an emphasis on restoration in the Upper Missouri, Jefferson, and Big Hole watersheds. The majority of the treated areas (5,500 acres per decade) would occur within the Upper Missouri River watershed. Treatments would focus on medium and large tree size, high density, dry Douglas-fir and ponderosa pine stands.

Currently, there are approximately 34,000 acres of medium and large tree size, high density, dry Douglas-fir and ponderosa pine habitat within the Upper Missouri River watershed compared to 7,000 acres estimated to be historically present. Proposed treatments could reduce the acreage of high density trees to approximately 28,500 acres in the first decade. After two decades approximately 23,000 acres would remain in a high density condition.

Treatment of 3,000 acres per decade of medium and large tree, high density dry forest in the Jefferson watershed would reduce current acreages from 19,000 acres to 16,000 acres per decade and down to as low as 13,000 acres after two decades compared to an average of 4,900 acres historically found in the watershed.

Treatments of 2,300 acres of medium and large tree, high density dry forest in the Big Hole watershed would reduce current acreages from 14,000 acres to 11,700 acres in the first decade and down to as low as 9,400 acres after two decades which would move the Big Hole close to the historic average of 7,000 acres.

The dry forest types are often used by big game species during winter months and a reduction in tree densities would result in an increase of forage for big game. However, reducing tree densities would create open stands that could increase the vulnerability of big game to hunting and predation.

Management for mature, open dry forests would increase or improve habitat for a variety of resident and migratory birds, large and small mammals, amphibians, and reptiles. Although there would be long-term benefits to species that depend on open, dry forest stands, such as flammulated owls, there could be a decline in the amount of habitat available for those species that prefer more dense forest types.

Additional impacts would occur from temporary road construction for forest treatments. Roads would reduce

habitat and could potentially increase the level of disturbance and displacement of wildlife species from project areas. To reduce disturbance to wildlife, temporary roads would be closed within one year of project completion. Because Alternative D would entail building more temporary roads for treatments (more acres treated) and would allow temporary roads to remain open longer, this alternative would have more negative effects to wildlife from temporary roads than Alternatives B and C.

Overall, Alternative D would move more acres towards the historic range and restore more habitats for wildlife dependant on dry forest than all other alternatives. This alternative, however, would also have the most short-term effects from disturbance of all alternatives. Over the long-term, management towards pre-fire suppression conditions would benefit the majority of species that utilize these vegetation communities.

Cool, moist forest is the least available habitat type in the Decision Area and is predominately located in the Big Hole and Upper Missouri Watersheds. Under Alternative D, up to 5,050 acres of medium to large size, high density, cool, moist forest could be treated per decade within the Decision Area. Treatments would occur in the same watersheds as Alternatives B and C. Three watersheds would have the majority of treatments, Upper Missouri, Jefferson, and Big Hole.

Up to 2,050 acres per decade could be treated in the Upper Missouri watershed in this habitat type. In the Upper Missouri, this could reduce mature, dense, cool forest stands from 6,000 acres to 3,950 acres in the first decade which would be close to the historic average of 4,300 acres.

In the Big Hole watershed, up to 1,500 acres could be treated per decade to reduce the current amount of mature, dense cool and moist forest from 5,500 acres to 4,000 acres in the first decade and down to as low as 2,500 acres within two decades, taking the number of acres to near the historic average of 2,400 acres.

Although there is very little known cool, moist forest in the Jefferson watershed (approximately 1,500 acres), Alternative D would propose to treat up to 500 acres per decade. This is more than under all other alternatives.

The Blackfoot, Gallatin, and Yellowstone watersheds could have a small number of acres of mature, high tree density cool forest treated (175 acres in the Yellowstone and Blackfoot and 75 acres in the Gallatin). The effects on wildlife, either beneficial or detrimental, from treatments in these watersheds would be minimal.

There could also be a small number of acres treated in the Missouri, Big Hole, Yellowstone, and Gallatin watersheds to thin seedlings and pole-sized trees in cool forest habitats. Up to 250 acres per decade could be thinned in the Missouri, 300 acres per decade in the Big Hole and only 25 acres per decade in the Gallatin and Yellowstone watersheds. This would have minor effects to wildlife.

Reduction of stem density and creating small openings would be beneficial to wildlife that occurs in this vegetation community. Creation of small openings would increase vegetation and habitat diversity as well as increase available forage for big game and other species. Increased vegetation diversity and understory development would improve habitat for many small and large mammals and migratory and resident birds. Improvement of habitat for prey species would benefit large predators within cool, wet forests.

Alternative D would treat a total of 5,050 acres per decade of cool, moist forest, which would be more than under all other alternatives. Treatments would result in temporary displacement of wildlife within project areas to adjacent forest areas. However, displacement would be expected to be temporary and habitat would ultimately be improved by creating a diversity of habitats. Additional impacts would occur from temporary road construction for forest treatments. Roads would reduce habitat and could potentially increase the level of disturbance and displacement of wildlife species in these areas.

Like Alternative A, Alternative D would not have retention guidelines or recommendations for restoration of snag and down woody habitat. Snag improvement projects could occur in conjunction with timber management projects but snags would not be actively recruited in snag deficient areas. Alternatives D, A and C would create fewer snags in snag deficient areas than Alternative B.

Unlike Alternative A, snags that have been created naturally through insects, disease and fire would be retained, to some degree, under Alternative D. This would retain habitat for snag dependant species while allowing commodity removal.

For timber salvage, Alternative D differs from Alternatives B and C when contiguous areas of dead and dying forest exceed 1,000 acres. Under Alternative D, 30 percent of the affected area would be retained unless necessary for human safety. Alternative D would require fewer acres of dead and dying forest to be retained compared to Alternatives B and C. Although Alternatives B and D would protect dead and dying forests, Alternative C would guarantee the protection of moderate to large blocks of dead and dying forests. Connectivity and diversity of habitats as well as species productivity could be less for those species dependent on snag habitat under Alternative D than with Alternatives B and C but more than under Alternative A.

The effects of firewood cutting would be the same as Alternative B.

Grasslands make up the majority of habitat in the Decision Area (45 percent) and conifer encroachment is

currently causing a severe decline in the quality and quantity of this habitat type. Although sagebrush shrubland is only found on 7 percent of the Decision Area, this habitat type provides essential habitat for sagebrush obligate species.

Treatments in grasslands and shrublands would move towards pre-fire suppression and away from the effects of historic grazing. This would improve and protect habitat for species that are dependent upon this vegetation community. Conifer encroachment has reduced the amount and quality of breeding, brood rearing, foraging, and cover habitat for a wide range of wildlife species.

Alternative D would treat up to 19,100 acres (14 percent) of grasslands and 6,800 acres (35 percent) of shrublands per decade in the Decision Area to reduce conifer encroachment and improve the health and resiliency of these communities. Alternative D would restore more acres of grasslands and shrublands than all other alternatives. Although Alternative D would have more short-term adverse effects to wildlife from disturbance, the long-term benefits from increased habitat for breeding, forage and cover would outweigh the short-term impacts. The loss of conifers could have negative effects to nesting migratory and resident birds but habitat for these species has not been found to be limiting.

Under Alternative D, the quality and quantity of grassland and shrubland habitat would be restored on more acres than under all other alternatives. The majority of treatments would occur in the Upper Missouri, Jefferson, and Big Hole watersheds.

Alternative D would treat the most acres of noxious weeds of all alternatives (up to 61,000 acres). Assuming implementation of the high end of proposed treatment acreages, Alternative D would treat 41,000 acres more than Alternative A, 11,000 more acres than Alternative B and 23,000 more acres than Alternative C. This alternative would restore more acres of wildlife habitat by reducing noxious weeds than all other alternatives.

Alternative D would restore and protect bitterbrush and mountain mahogany habitat. Effects would be the same as Alternative B.

Alternative D would allow the greatest amount of over ground vegetation to be consumed during prescribed fire (90 percent). This would allow more removal of target vegetation such as conifers in grasslands or shrublands but could result in a greater time for re-colonization of target grasses, forbs, and shrubs.

Like Alternative A, there would be no timing restrictions for prescribed burning or mechanical treatments. This could result in more mortality of migratory and resident birds than under Alternatives B and C.

Fifty-foot Streamside Management Zones would be implemented under Alternative D, the same as Alternative A. The effects from SMZs would be the same as described under "Effects Common to All Alternatives" and as described for Alternative A. Smaller riparian management areas proposed under Alternatives D and A, along with the types and extent to management activities allowed in SMZs, could reduce breeding, foraging, and hiding habitat and reduce the quality and quantity of movement corridors for a wide range of species.

Alternative D could actively restore (through mechanical treatments) up to 1,700 acres of riparian vegetation per decade, more than under any other alternative. Although the most riparian acres could be targeted for active restoration under Alternative D, Alternatives D and A would provide the least amount of direction for riparian management. Like Alternative A, Alternative D would allow management of the riparian areas strictly for commodity removal. Alternatives A and D could cause a reduction in breeding, brood rearing, foraging, denning, overwintering and travel habitat for a wide range of species.

Like Alternative B, Alternative D could actively restore aspen stands to improve and expand habitat for wildlife. Nesting habitat for birds, including migratory birds, could be increased and so could an important winter food source for elk, deer, and moose.

The effects of firewood cutting in riparian areas would be the same as under Alternative B.

Livestock exclosures would be checked and maintained every five years. Alternative D would protect more riparian areas from livestock grazing and trampling compared to Alternative A which does not require maintenance of exclosures. However, damaged and non-functional exclosures could allow access to riparian areas and streams between 5 year maintenance intervals. Due to this, Alternative D would provide less protection to riparian areas than Alternative C but, possibly, more protection compared to Alternative B (depending on the maintenance schedule developed under Alternative B.) The type of grazing, acres available for livestock grazing and effects to wildlife would be the same as under Alternative A.

Alternative D would have the same buffer prescriptions associated with bighorn sheep and domestic sheep as Alternative A. The implementation of buffers between domestic sheep and goat allotments and bighorn sheep habitat up to 9 miles in width could reduce the potential for disease epidemics within bighorn sheep populations. Although Alternatives D and A allow for a voluntary buffer of up to 9 miles, these alternatives would not have a minimum buffer width. These alternatives would not guarantee adequate separation between wild and domestic sheep to prevent disease transmission. Alternatives B and C would provide minimum buffer widths between wild and domestic sheep. Unlike Alternative A, Alternative D would provide specific guidance when using domestic sheep for weed control in occupied bighorn sheep habitat (same as Alternative B). This would help in preventing disease transmission to wild sheep during weed control activities.

Unlike the other action alternatives, Alternative D would allow some new, permanent roads to remain open to the public if travel plan objectives are met. Since Alternative D would treat the most vegetation acres of all alternatives, there would be more need for permanent road construction to facilitate multiple entries to meet objectives. Because Alternative D would allow more new, permanent roads and fewer roads would be closed during travel planning, this alternative could have substantially more negative effects to wildlife associated with roads than Alternatives B and C. Under Alternative D, there would be more loss of habitat due to road construction, an increase in disturbance and harassment to wildlife, an increase in the spread of noxious weeds and a greater change of direct mortality through road kill.

Like the other action alternatives, temporary roads would be kept to a minimum under Alternative D. However, temporary roads would not be required to be closed within a certain time after project implementation. Open temporary roads could be used by the public and would cause more displacement of wildlife than under Alternatives B and C.

Alternative D would protect and maintain fewer acres of functional big game winter/calving range by allowing new permanent road construction in areas where the road density exceeds 0.5 mi/mi^2. Alternative D would allow new roads to be built in areas of low road density. This alternative could substantially reduce the quality of habitat for big game and other wildlife species as well as the amount of functional habitat by allowing new permanent roads in areas that currently provide high quality habitat. Christensen et al. (1993) found that open road miles less than 0.5 mi/mi^2 provide elk habitat that is roughly 70 percent functional. A sharp decline in habitat effectiveness was found when road densities reached 1 mi/mi^2 and above (Christensen et al. 1993).

There would be two proposed ACECs common to all the action alternatives, Sleeping Giant and Humbug Spires. Alternative D would propose one additional ACEC, Humbug Spires. The effects of the Sleeping Giant ACEC are described under "Effects Common to All Alternatives."

Effects of the proposed Humbug Spires ACEC would be the same as under Alternatives B and C.

Under Alternative D, the Elkhorns ACEC would only include the existing Tack-on Wilderness Study Area boundary (3,575 acres). This is substantially different from Alternatives B and C where the size of the Elkhorns ACEC boundary would be 50,431 and 67,665 acres, respectively. Under Alternative D, the proposed Elkhorns ACEC would be managed for semi-primitive, non-motorized recreation which would benefit wildlife species by reducing the level of disturbance and maintaining habitat (same management direction as existing WSA).

Currently, the entire Elkhorn Mountain Range is managed under a Memorandum of Understanding (MOU) between the MFWP, USFS, and BLM for wildlife and recreation. If, at some time in the future, the MOU is withdrawn, BLM lands in the Elkhorn Mountains would revert back to multiple use management and wildlife and their associated habitat might not be adequately protected. Unlike Alternatives B and C, Alternative D would not ensure BLM lands within the Elkhorn Mountain Range are managed for wildlife objectives and goals. The Elkhorn Mountains would not necessarily be managed to support populations of wildlife species associated with endemic vegetative communities if the MOU is withdrawn.

Alternative D would not implement food storage regulations at recreation sites to prevent conflicts between bears and people. This would pose more risk of bears being moved or killed due to interactions with humans than under Alternatives B and C.

During new and existing mineral operations, Alternative D would allow facilities and roads to be constructed in riparian areas. This would cause more loss of wildlife habitat and disturbance than under Alternatives B and C. The loss of habitat could be long-term and major depending on the type and extent of activity.

All alternatives would have five stipulations to lessen the effects of oil and gas development on wildlife (stipulations that affect special status species are described under "Special Status Species"). Under Alternative D, these stipulations would include NSO in state wildlife management units and timing restrictions in big game habitat.

The acres of available habitat would be the same for each alternative (**Table 4-8**) but the stipulations would vary between alternatives.

Stipulations for wildlife management areas would be similar for Alternatives D, A, and B but under Alternative A, there would be "core" areas surrounding the wildlife management unit that would have the most restrictive stipulation of NL.

Alternative D would have the same timing restriction as Alternatives A and B for big game winter and spring range (12/1-5/15). Of the 498,973 acres of big game winter/spring range in the oil and gas leasing Decision Area, 97,454 acres would be overlapped with more protective NSO stipulations or No Lease areas, leaving about 401,519 acres protected with the Timing Limitation stipulation. Within the five areas with the most potential for oil and gas exploration and development, 15,589 acres (least of all alternatives) of the 99,550 acres of big game winter/spring range would be overlapped with more protective NSO stipulations or No Ease areas. Considering the overlap of more protective stipulations, Alternative D would provide the least protection to big game winter/spring range of all alternatives. Although Alternatives D, A, and B would provide varying protec-

tion to overwintering big game from disturbance, Alternative C would provide the greatest amount of protection to big game by preventing both disturbance and loss of habitat with a NL stipulation.

Alternative D would have the same timing restriction in big game calving habitat as Alternative A, 5/1-6/30. This would be less time available free of disturbance to individuals that may give birth early or as a refuge to big game before they give birth than under Alternatives B and C.

Alternatives D and B would also increase the timing restriction in year-round bighorn sheep habitat by two months (11/1-6/30) over Alternative A. Of the 131,279 acres of bighorn sheep year-round habitat, approximately 31,711acres (least of all alternatives) would be even more protected with overlapping NSO stipulations or No Lease areas, leaving about 99,568 acres being protected by the Timing Limitation stipulation. Of the approximately 37,000 acres of bighorn sheep habitat within the five areas most likely to have oil and gas exploration and development, 6,880 acres (11,363 fewer acres than under Alternative A, 23,145 fewer acres than under Alternative B) would be overlapped with more protective NSO stipulations or No Lease areas, leaving about 30,120 acres protected by the Timing Limitation stipulation. This would provide more refuge for sheep during lambing (most lambing occurs between April and June with some lambing occurring in early July) and going into the difficult winter season. Alternatives D and B would provide less protection than Alternative C which would prevent disturbance to bighorn sheep as well as prevent loss of habitat from oil and gas exploration and development with a NL stipulation.

Alternative D would have the same timing limitation in bighorn sheep core habitat (12/1-5/15) as Alternative A. Alternatives D and A would be less protective of bighorn sheep and core habitat than Alternatives B and C which would protect crucial habitat for bighorn sheep from disturbance as well as from loss of habitat.

Alternative D would not withdraw 180 acres of riparian habitat in the Muskrat Creek watershed. There could be a loss of habitat for a variety of species in the Muskrat Creek watershed under Alternatives D and A.

FISH

Effects Common to All Alternatives

Because of the programmatic nature of the proposed alternatives, qualitative effects from management activities on fish and aquatic ecosystems are addressed under "Effects Common to All Alternatives." Some effects may vary due to the degree of an activity such as the amount of vegetative treatments or road closures. These "quantitative" effects are addressed under each alternative. More specific analysis would be required to determine the extent of potential impacts from site specific management actions. This analysis would be completed when a management action is clearly defined.

Proposed management of the following resource programs would have no anticipated impacts to fisheries; Air Quality, Paleontology, Cultural Resources, Visual Resources, Economics, and Environmental Justice.

Water Quality

In their natural environment, the survival of fish and other aquatic species depends upon many factors including; finding food, predator avoidance, immune system health and reproduction. Although sediment is a natural part of the aquatic ecosystem, an increase in fine sediment has the potential to affect all of these factors as well as cause stressful conditions that could increase aquatic species' susceptibility to disease.

An increase of sediment to aquatic systems can happen through ground disturbing activities such as vegetation treatments using mechanical methods and/or prescribed fire, livestock grazing, mining, energy development, road construction and use, recreational activities such as trail construction and use (especially motorized use) and campground development in riparian areas (Meehan 1991).

An increase above the natural sediment load in streams can prevent the successful capture of prey and limit the ability of fish to obtain food. Sediment in streams may also be deposited in spawning gravels where it can smother eggs and reduce the amount of interstitial spaces available for eggs, juvenile fish, and other organisms. This is especially critical in the winter months when interstitial spaces are used as refugia and allow fish and other aquatic species to survive under severe flows and temperature conditions.

Developing fish eggs and larvae need a constant supply of cold, oxygen rich water which flows through the interstitial spaces in stream gravels. Embedded sediments fill these interstitial spaces and also limit essential winter habitat used by juvenile fish for cover from predators, ice scour and high-velocity stream flows. The filling of pools with sediment further limits overwintering sites for juvenile and adult fish (Meehan 1991).

Significant increase in sediment deposition can also lead to alterations of stream morphology causing a widening of the stream, an increase in subsurface flow and stream channel instability.

Direct effects of sediment on aquatic invertebrates includes; loss of habitat due to scouring of streambeds, dislodgment of individuals, smothering of benthic communities, loss of interstitial spaces between substrate, abrasion of respiratory surfaces and interference of food uptake for filter feeders (Beschta et al. 1995). Many of the macroinvertebrates that are favored as food (e.g. mayflies, caddisflies and stoneflies) by stream dwelling fish prefer coarse streambed substrates and are harmed

by an increase of fine sediments, while others (e.g. midges) are considered to be more tolerant.

Accelerated runoff can trigger downcutting of the streambed, which lowers the streambed, alters the water table, dries out the riparian area, destabilizes streambanks, increases erosion, and further accelerates runoff. Unless stopped by some form of intervention or a hard geologic formation, downcutting may migrate upstream and further disrupt the hydrologic function of the stream system (Rosgen 1996).

Water quality can be affected not only from an increase in sediment but also from an increase in nutrients, pollutants, or heavy metals. Metals are naturally present in varying concentrations in all surface waters. Mining, however, may cause concentrations of dissolved metals to exceed background levels, particularly in situations involving acid mine discharge. The chief metals associated with mining released to streams include; arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, and zinc. These substances may produce toxic effects alone, in combination or synergistically that include direct mortality, behavioral changes or reproductive failure in aquatic organisms (Meehan 1991).

Nutrients can be elevated in streams from management activities such as timber harvest and associated road construction, prescribed fire and livestock grazing which can increase algal production. An increase in algal blooms can reduce interstitial spaces and dissolved oxygen in the stream (Meehan 1991).

Riparian Vegetation

Riparian vegetation directly influences the condition, quality, and maintenance of aquatic habitats. Riparian plants filter sediments and nutrients, provide shade, stabilize streambanks, provide cover in the form of large and small woody debris, produce leaf litter energy inputs, and promote infiltration and recharge of groundwater (Forest Ecosystem Management Assessment Team 1993 and Takahi et al. 2002). As a result of these functions, spawning beds for fish and microhabitats for macroinvertebrates remain relatively free of damaging fine sediment deposits. Riparian vegetation reduces sedimentation of pools, thereby maintaining water depths and structural diversity of the channel. Base flow levels are augmented throughout the year by the slow release of groundwater. Complex off-channel habitats, such as side channels, and undercut banks are often formed by the interaction of stream flow and riparian features such as vegetation and large woody material. These areas of slower water provide critical refuge during floods and high flows for a variety of aquatic species and serve as rearing areas for juvenile fish (Brown et al. 1988).

The bank stabilizing function of streamside vegetation not only helps reduce erosion and influence channel morphology but also acts to supplement instream cover by the development of undercut streambanks and by providing overhanging vegetation. Well-vegetated stream channels and stable streambanks help reduce turbidity and channel scouring resulting from high flows and can enhance primary production (Beschta et al. 1995).

Riparian trees provide streams with critical instream habitat components such as woody material that creates pools, slows high flows, provides refuge during the summer and winter for aquatic species, and provides shade, cover and a prey base for many species. Woody material also protects streambanks from erosion and provides microsites for riparian vegetation to be established.

Effects of Management Actions

All programs would be managed and implemented to improve or maintain riparian conditions that are essential for quality fish and aquatic habitat. When this is not possible (as could occur with activities such as placer mining), measures would be taken to reduce risks to aquatic resources and to restore stream systems. However, those projects that remove habitat features or degrade aquatic habitats would have a negative impact to fish and other aquatic organisms.

By using mechanical methods and prescribed fire, sagebrush, grasslands and forests would be restored to improve species composition, distribution, and vigor. This could create short-term pulses of sediment, nutrients, and runoff to streams due to soil disturbance and compaction and vegetation removal (Meehan 1991). In the long-term, however, restoring vegetation structure, density, species composition, and pattern would reduce the risk of unnaturally large wildland fire events and reduce the risk of excessive runoff and sedimentation. By restoring these habitats to a more "healthy" state, the risk of excessive sedimentation and erosion would be reduced and, in forested riparian areas, large trees would be promoted to provide a source of large woody material along floodplains and within instream habitats. Water flows would be restored to more natural conditions, allowing for more water storage and slow release to streams. Understory vegetation would be promoted in currently dense stands of dry forest and there would be a reduction of noxious weeds.

Some vegetative projects would involve multiple treatments of the same area. This could involve using mechanical treatments to prepare an area for a prescribed burn. Prescribed fires conducted in the spring (when drainage-bottoms are still snow covered) help to protect riparian vegetation and soils whereas burns in the fall could potentially cause more loss of riparian vegetation as well as an increase of runoff, sediment, and nutrients to streams. The primary goal of these projects would be to restore vegetation and move towards the historic range of conditions that would allow aquatic species to withstand the effects of natural disturbances.

Mid-term (10 year) projections indicate noxious weed populations would increase even with implementation of weed management plans, statutes, and regulations due to expansion of existing populations and new infestations associated with roads and areas of disturbance. Weed management activities such as selective grazing, herbicide application, biological control agents or mechanical treatments could produce some short term minor effects on fisheries and aquatic resources that could include, but are not limited to, increases in sedimentation, changes in water chemistry due to the delivery of chemicals, reduction in shade or thermal cover or an increase in bank instability from the loss of vegetative cover. These short-term negative effects should be overshadowed by the long-term benefits on the aquatic resources as native or desirable species become re-established.

Restoring riparian vegetation would benefit streams and riparian areas by improving a large tree component as well as down woody material in the stream channels and along floodplains. Restoration treatments may have short-term adverse effects due to disturbance and may cause a short-term pulse of sediment to stream channels but would have long-term beneficial effects such as stabilizing streambanks, increasing shade, reducing fine sediment, reducing runoff, improving ground water storage and providing habitat features (down wood, undercut banks) to the stream and riparian habitat.

Aquatic habitat would be restored, when necessary, to improve unsatisfactory or declining habitat. This would include restoration of riparian vegetation to improve shade, increase down woody material, improve storage of ground water, and protect streambanks. Restoration of aquatic habitat would also include providing habitat features such as instream woody material for cover, overwinter habitat, refugia, shade, and forage. In pool deficient streams, pools could be created to provide both winter and summer habitat. In some cases where a stream has been severely altered or degraded, such as with placer mining, the stream may need to be reconstructed. Roads and road crossings could be removed to reduce fine sediment and runoff to streams, restore riparian vegetation, and remove migration barriers to fish.

All alternatives would be subject to management under Montana Streamside Management Zones (SMZs) which allow activities such as logging, prescribed fire, and road building in riparian areas (generally 50 feet on either side of a stream) but restricts how many trees can be removed and where road construction can occur. Restricting management activities associated with logging and road construction in riparian areas would maintain some of the functional capacity of wetlands and riparian areas and help to reduce and trap sediment generated from management activities. However, only 50 percent of trees >8 inches DBH on each side of stream or 10 trees per 100-foot stream segment would be required to be retained within SMZs. Although this would provide some protection to streams, the loss of riparian vegetation and soil disturbance may cause negative impacts to streams from increased runoff, loss of large woody material and sedimentation.

BMPs (**Appendix E**) would be used to avoid or minimize adverse effects to water quality from sedimentation and pollution and help to protect the quality of instream habitat.

The risk of pollutants entering streams would be reduced by requiring storage of chemicals outside of riparian areas, having a spill prevention and control plan and not allowing refueling within riparian areas (with the exception of mining activities, fire suppression and reclamation and chainsaw re-fueling).

Livestock grazing may have harmful effects on riparian habitat as well as on fish and aquatic resources depending on the intensity of grazing within riparian areas. Grazing that is too intensive, or occurs for too long duration within a riparian area, can cause increases in sedimentation and introduce nutrients to the aquatic environment. Grazing can cause bank trampling that can destabilize stream banks and cause the loss of undercut banks and channel erosion. Grazing can also lead to a loss of vegetation density, diversity, and vigor (Meehan 1991).

Implementation of Allotment Management Plans, Coordinated Resource Management Plans and Land Health Standards and Guidelines would move towards developing stable, deep-rooted vegetation which would stabilize streambanks, reduce soil erosion, and improve riparian condition. Implementation of Land Health Standards and Guidelines would prevent the degradation of riparian habitats and would also improve the health of all vegetative communities where grazing has caused degradation to riparian communities and stream systems.

The health and integrity of riparian vegetation would be protected and improved by fencing, development of upland water sources, timing livestock use to avoid sensitive periods in spring, and reductions in grazing intensity and trampling. These types of activities would protect and restore riparian vegetation, protect and restore streambeds and banks and reduce sedimentation and nutrient additions to streams. Suspension of grazing in riparian areas where livestock use has caused site degradation would help meet riparian goals and proper functioning condition.

Fuels projects would be designed and implemented in a manner that minimizes impacts to aquatic resources. Mechanical treatments and prescribed burning used to reduce fuel loading or for restoration of vegetation communities could cause short-term pulses of nutrients (especially in the case of prescribed fire) and fine sediment as well as increased runoff.

Although wildland fires could still occur in areas where hazardous fuel loads have been reduced, fires would be expected to be predominately understory burns exhibit-

ing less intensity and less severe burning conditions than crown fires. These understory burns are easier to control with lower-impact suppression methods (such as hand-built firelines) and would be less likely to adversely affect aquatic resources. In contrast, the crown fires associated with heavier fuel loads often require suppression techniques likely to have greater adverse impacts to aquatic habitats and species.

Wildland fire suppression may involve activities typically not desired within riparian areas to protect human safety or prevent major losses within riparian and upslope habitats. These activities might include, but are not limited to, tree felling/fireline placement, operation of heavy equipment, crossing of streams, road construction, use of chemical retardants and removal of water. Incident bases, helibases, and staging areas would be located outside of riparian areas, if at all possible. These activities could increase fine sediment and runoff and decrease riparian vegetation and down woody material along streambanks and riparian areas. These activities could also decrease shade, degrade streambed and banks, and allow contaminants to enter streams. Wildland fire suppression, particularly in riparian areas, could have varying degrees of effects (negligible to major, short term to long-term) depending on the size, location, and intensity of suppression activities.

Travel management could improve and benefit aquatic habitat by closing roads in riparian areas and removing road crossings.

Recreation activities, such as camping, OHV use, boat use and fishing and can have negative effects on fish and aquatic resources. Effects include displacement of species from their typical habitats due to human presence or recreation related facilities, species mortality (fishing), and habitat degradation (loss of riparian vegetation, increase in fine sediment and bank trampling).

Special designations, such as Wilderness Study Areas, Wild and Scenic Rivers and ACECs would have beneficial effects to fisheries and aquatic resources. These areas are typically designed to protect, restore, or enhance habitat (both aquatic and terrestrial). Additionally, these areas minimize or limit disturbance, allowing habitat conditions to exist in near natural conditions.

Mining activities, placer operations in particular, may lead to a loss of riparian and/or wetland vegetation. All vegetation within the active mining area is removed before and during mine development and operations. Vegetation immediately adjacent to mining activities could be lost or degraded by roads, water diversions and other related developments. Riparian and/or wetland vegetation has a significant influence on certain stream types. Changes in composition, vigor, and density of riparian vegetation can result in changes in sediment input, stream shade, instream erosional processes, terrestrial insect habitat, and the contribution of detritus and structural components to the stream channel. Water quality is also related to the quality and quantity of riparian and wetland vegetation.

Much of the Decision Area is subject to mineral and energy exploration and development. The effects to fish and other aquatic species from minerals and energy exploration and development would range from minor to major and could have both short-term and long-term effects. Surface mining operations can disrupt surface and groundwater flow patterns. Mining operations also have the potential to release pollutants to surface and groundwater, contaminate soils and cause the eventual incorporation of pollutants into plant tissue. Both water and soil contamination may be harmful to riparian and wetland vegetation. Mineral exploration and extraction could cause increased sedimentation or loss of aquatic habitats from road construction, mining activities and the relocation or diversion of streams.

There are approximately 652,194 acres of federal mineral estate lands potentially available for oil and gas exploration and development in the Decision Area. Actual acreages available vary based on proposed stipulations by alternative. In the Decision Area, five areas have been identified with the most potential for oil and gas exploration and development (low to moderate potential overall) where there would most likely be reasonably foreseeable development and drilling activity (Appendix M). The five areas are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. The total area within these five areas is roughly 116,295 acres. Each of the five areas range in size from 1,400 to 50,600 acres.

It is estimated that a total of 31 conventional oil and gas wells could be drilled, most likely within the five areas with the most potential over 15-20 years. Nineteen of these wells would be exploratory, with six of them being producers. The RFD assumes that there would be two additional step-out wells developed for each of the six producers, resulting in a total of 18 producing wells overall. The RFD also assumes that seven of these producing wells would be on federal mineral estate with the remainder being non-federal. As many as 40 wells might be drilled for coal bed natural gas, most likely near Bozeman Pass. None of this activity is forecast to take place on federal mineral estate.

Under all alternatives, there would be one stipulation to lessen the effects of oil and gas development on fish (stipulations that affect special status fish species are described under "Special Status Species"). This stipulation would protect Class 1 fisheries to different degrees based in the type of stipulation under each alternative. A No Surface Occupancy (NSO) or No Lease (NL) stipulation would have the greatest benefit to Class 1 fisheries by preventing loss of habitat. Controlled Surface Use (CSU) would allow exploration

and development in the areas adjacent to streams but would provide some degree of protection by limiting the amount and type of use.

The effects from reclamation activities associated with abandoned mines lands on fish and other aquatic species should be minimized with BMPs (**Appendix E**) and would be expected to be beneficial. Mining features that discharge water with elevated levels of contaminants to surface waters, or directly to streams could have negative effects on fish and other aquatic organisms, depending on volume and constituent concentrations. The effects from mine drainage could result in direct mortality, behavioral changes, or reproductive failure.

The effects from renewable energy programs (i.e., hydroelectric, solar, and wind power generation) in the Decision Area would generally be expected to be minor. Effects to aquatic organisms from renewable energy projects could include increased runoff from access roads and other structures.

Rights-of-way grants and easements may promote the construction of paved or unpaved access roads, gravel pads, and utility corridors which could adversely affect aquatic habitats through increased runoff and fine sediment and contaminants.

Effects of Alternative A

Under Alternatives A and D, riparian areas would only be protected with Streamside Management Zones (SMZ) of generally 50 feet for fish bearing and non-fish bearing streams. The SMZ would provide some protection for fish and aquatic resources by restricting certain forest activities. Forest management would not be required to benefit riparian areas and management could be conducted strictly for product removal. Since management could occur in up to 50 percent of the SMZ, down woody material in riparian areas and large woody recruitment to streams could be negatively affected. There could also be a risk of sedimentation to streams from the use of SMZs.

Table 4-9 and **Table 4-10** show acreages of SMZs and Riparian Management Zones (RMZs) of forested and non-forested land for each alternative by watershed in the Decision Area.

Alternatives A and D would provide the least amount of riparian habitat protected, approximately 3,528 acres (**Table 4-10**). Under Alternatives A and D, the Upper Missouri and Big Hole watersheds would have the most acres of riparian area covered by SMZs across all water body types (1,670 and 928 acres, respectively). Management of SMZs under Alternatives A and D would allow a large amount of the 3,528 acres to be accessed for commodity removal and would not necessarily provide for overall protection of riparian function.

Alternatives B and C would have larger areas identified for riparian management that would maintain, restore or preserve riparian functions and values including providing functional wildlife movement corridors (especially under Alternative C). Alternatives B and C would still allow RMZs to be actively "managed" to restore habitat and maintain the health and function of riparian areas and streams. The type and extent of projects that would be allowed in riparian areas under Alternatives A and D could cause more negative effects from increased sedimentation, runoff and reduction of riparian and instream habitat quality than Alternatives B and C. The effects to riparian and aquatic habitats from Alternatives A and D could be minor to major and could be short to long-term.

The limited amount of riparian habitat in the Decision Area makes this habitat type important to restore or protect.

Firewood cutting with no diameter size limit could occur within riparian areas and both down wood in riparian areas and large woody material recruitment to streams could by negatively affected by this alternative.

Unlike the action alternatives, aspen would not be identified for restoration or protection under Alternative A.

Table 4-9
Acres of Riparian Management Areas in Forest Lands per Watershed by Alternative

	Fish Bearing			Perennial Non-fish			Intermittent	Total Forest		
	A & D	B	C	A & D	B	C	A, B, C, D	A & D	B	C
Riparian Management Width	**50 feet**	**160 feet**	**300 feet**	**50 feet**	**80 feet**	**150 feet**	**50 feet**			
Big Hole	174	597	1,216	131	220	426	214	519	1,031	1,856
Blackfoot	9	30	58	2	4	8	0	11	34	66
Boulder	81	266	579	79	134	263	75	235	475	917
Jefferson	95	317	639	46	78	154	58	199	453	851
Madison	5	18	40	0	0	0	0	5	18	40
Upper Clark Fork	5	18	38	0	0	0	4	9	22	42
Upper Missouri	187	684	1,585	241	404	785	281	709	1,369	2,651
Upper Yellowstone	18	73	169	18	32	65	0	36	105	234
Total	**574**	**2,003**	**4,324**	**517**	**872**	**1,701**	**632**	**1,723**	**3,507**	**6,657**

Table 4-10
Acres of Riparian Management Areas in Non-Forest and Total Riparian Management Acres (forested and non-forest habitats) per Watershed by Alternative

	Perennial (including fish bearing)		Intermittent	Total Non-Forest		Total Riparian Management Acres (Forest and Non-Forest)		
	A, B, & D	C	A, B, C, D	A, B, & D	C	A & D	B	C
Riparian Management Width	50 feet	150 feet	50 feet					
Big Hole	291	930	118	409	1,048	928	1,440	2,904
Blackfoot	20	66	0	20	66	31	54	132
Boulder	71	197	22	93	219	328	568	1,136
Jefferson	77	258	112	189	370	388	642	1,221
Madison	9	36	0	9	36	14	27	76
Upper Clark Fork	2	10	0	2	10	11	24	52
Upper Missouri	826	2,458	135	961	2,593	1,670	2,330	5,244
Upper Yellowstone	121	393	1	122	394	158	227	628
Decision Area Total	**1,417**	**4,348**	**388**	**1,805**	**4,736**	**3,528**	**5,312**	**11,393**

Although riparian restoration could occur through other projects or as a result of Land Health Standards, only 30 additional acres of riparian restoration per decade would be expected under this alternative. This is up to 670 fewer acres than under Alternative B, up to 170 fewer acres than under Alternative C and up to 1,670 fewer acres than under Alternative D. Although short-term impacts from disturbance would be lowest with Alternative A, the long-term benefits from restored habitat and vegetation diversity and composition would be much less than under any of the action alternatives.

Alternative A would restore fewer acres of shrubland, grassland, and forest habitats than Alternatives B and D but more than Alternative C. Alternative A would be less effective at restoring overall watershed function and riparian and stream functions compared to Alternatives B and D but, potentially, more effective than Alternative C.

Assuming that the high end of the range of proposed weed treatments is implemented under any alternative, Alternative A would treat the fewest acres of noxious weeds and would have the greatest negative effects from loss of native riparian vegetation. Monotypic stands of annual weeds with poor soil retention/stabilization properties or invasion of streambanks or wetlands by undesirable non-native species would continue at a greater level than under the action alternatives.

Since Alternative A would allow up to 5.5 miles of new permanent roads per year to access vegetation treatments and would close the fewest miles of roads through travel planning, the detrimental effects to riparian and aquatic habitats as described under "Effects Common to All Alternatives" would be greatest under this alternative and could be major and long-term.

Alternative A would allow the most acres of livestock grazing and would have the most potential for major and, possibly, long-term detrimental effects to riparian and stream habitats from bank trampling and loss of riparian vegetation as well as from other effects discussed under "Effects Common to All Alternatives."

Riparian exclosures would not be routinely maintained under this alternative and damaged exclosures could allow access to riparian zones and streams by livestock. This would negatively affect aquatic habitats by causing increased inputs of nutrients and sediment to streams, and a reduction of riparian vegetation.

As **Table 4-11** indicates, there would be only one ACEC, Sleeping Giant, proposed under Alternative A that would provide habitat for fish. Approximately 11.4

Table 4-11
Miles of Fish Bearing Streams within ACECs by Alternative

	Stream Miles with Special Status Fish				Miles of Other Fish Bearing Streams				Total Miles of Fish Bearing Streams			
ACEC	A	B	C	D	A	B	C	D	A	B	C	D
Elkhorns	0	5	5	2.7	0	6.8	8.7	0	0	11.8	13.7	2.7
Humbug Spires	0	0	0	0	0	7.4	7.4	7.4	0	7.4	7.4	7.4
Ringing Rocks	0	0	0	0	0	0	0	0	0	0	0	0
Sleeping Giant	0	0	0	0	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
Spokane Creek	0	0	0	0	0	0	0.4	0	0	0	0.4	0
Total	**0**	**5**	**5**	**2.7**	**11.4**	**25.6**	**27.9**	**18.8**	**11.4**	**30.6**	**32.9**	**21.5**

miles of fish bearing streams would be included in the Sleeping Giant ACEC under this alternative. Alternative A would provide the fewest miles of aquatic habitat protected under ACEC designations of all alternatives. Alternative A would follow the existing Sleeping Giant ACEC Management Plan. This plan would not allow active restoration of riparian areas or streams. The action alternatives, however, would modify the Sleeping Giant Management Plan to allow for aquatic habitat restoration, when necessary.

Four river segments, Upper Big Hole, Missouri River, Moose Creek, and Muskrat Creek were found to be eligible for Wild and Scenic Rivers but would not have a final determination under Alternative A. These rivers/streams would be managed to maintain Outstandingly Remarkable Values indefinitely under Alternative A.

All alternatives would have one stipulation to lessen the effects of oil and gas development on fish (stipulations that affect special status fish species are described under "Special Status Species"). Under Alternative A, this stipulation would be NSO within 1,000 feet on either side of streams with Class 1 fisheries.

With a NSO of 1,000 feet, approximately 10,000 acres adjacent to Class 1 fisheries streams would have some level of protection from loss of riparian habitat, sedimentation, and chemical spills in the Decision Area.

Class 1 fish streams are found in three of the five areas with the most potential for oil and gas exploration and development (Sleeping Giant, Canyon Ferry, and Livingston).

The Sleeping Giant area is located north of Helena and is approximately 47,000 total acres of subsurface and surface ownership with roughly 22,000 acres of BLM ownership. Approximately 330 acres in the Sleeping Giant area along the Missouri River would be protected with the 1,000 foot NSO for Class 1 fisheries.

The Canyon Ferry area is located in and around the town of Townsend and is the largest area with potential for oil and gas development. This area has approximately 51,000 acres of subsurface and surface ownership. Approximately 35,000 acres of BLM lands (surface) have some potential for oil and gas exploration and development with the majority of the acres located within the National Guard Firing Range. Approximately 113 acres in the Canyon Ferry area along the Missouri River would be protected with the 1,000 foot NSO for Class 1 fisheries.

The Livingston area is located immediately east of the town of Livingston and is approximately 8,450 acres of subsurface and surface ownership. There are approximately 1,600 acres of BLM lands (surface) in this area. Approximately 370 acres in the Livingston area along the Yellowstone River would be protected with the 1,000 foot NSO for Class 1 fisheries.

In the five areas with the most potential for oil and gas development, approximately 813 acres of Class 1 fisheries stream and riparian habitat would have some level of protection from loss of riparian habitat, sedimentation and chemical spills in the Decision Area. However, Alternative A would potentially provide less protection than Alternatives B and C (wider areas in NSO) but would be more protective than Alternative D (CSU).

Effects Common to Action Alternatives

Under all action alternatives, there would be an emphasis on protecting and restoring riparian areas and wetlands. All action alternatives would emphasize maintaining diverse, healthy, productive, well-distributed aquatic habitats and communities to increase populations of native fish and other aquatic species.

All programs would move towards meeting Land Health Standards. Implementation of Land Health Standards would maintain or move towards well rooted vegetation to stabilize streambanks, reduce soil erosion, and provide shade and structure.

Vegetation restoration treatments would mimic natural disturbance regimes and create vegetative communities that would be resilient to unnatural occurrences of insects, disease, and fire. This would protect riparian and aquatic habitats from the effects of uncharacteristically large disturbances, restore habitat features, and create a diversity of habitat conditions.

Management of riparian areas would provide the amount and distribution of large woody material characteristic of natural aquatic and riparian habitats. Riparian and wetland areas would be assessed and monitored for proper functioning condition. When streams are not "properly functioning", management activities would be changed or restoration conducted (when possible) to improve the long-term functioning condition of the stream and/or riparian habitat.

BLM would coordinate with FWP to reintroduce locally or regionally absent species, such as beaver. The reintroduction of beaver would provide a beneficial effect to fish and aquatic resources by creating deep pools, creating larger riparian areas behind dams, adding more water storage potential and providing greater flood protection (through an increase in the width of the riparian zone capable of storing water).

Maintaining existing water rights, monitoring water quality, and participating in the development of TMDL plans would protect and restore water quality for a wide variety of aquatic species.

Although exploration and mineral activities would take all practical measures to maintain, protect, or minimize disturbances to resources, aquatic habitat could be slightly to severely impacted by these types of activities. Effects would be the same as discussed under "Effects Common to All Alternatives."

Effects of Alternative B

Riparian Management Zones (RMZs) would be established for this alternative that would be wider than SMZs under Alternatives A and D, but narrower than RMZs under Alternative C (**Table 4-9**). These zones would differ in width by forested and non-forested habitat, stream type (fish-bearing, perennial or intermittent) and range from 50 feet (intermittent streams) to approximately 160 feet for fish-bearing streams (based on the height of two site potential trees) on either side of the stream. A site potential tree in the Butte Field Office is considered to have an average height of 80 feet. Riparian Management Zones would provide more protection to fish and aquatic resources than SMZs alone by restricting more management activities in larger areas adjacent to streams and by requiring management activities to restore or maintain riparian and stream function.

As **Table 4-10** indicates, Alternative B would have approximately 5,312 acres where the emphasis would be on riparian goals and objectives. The RMZs under this alternative would benefit riparian and stream communities more than SMZs under Alternatives A and D. Alternative B would have approximately 6,000 fewer acres in RMZs than Alternative C. The Upper Missouri and Big Hole watersheds would have the most acreage in RMZs under Alternative B (2,330 and 1,440 acres, respectively)(**Table 4-10**).

Riparian Management Zones under Alternative B would provide more riparian protection than under Alternatives A or D, but less than half the protection provided under Alternative C (**Table 4-9** and **Table 4-10**). Alternative B would allow management in RMZs to restore or enhance riparian communities and stream systems. There would be fewer negative effects from an increase in fine sediment and nutrients and a loss of large woody material with Alternative B than with Alternatives A and D. RMZs under Alternatives B and C would have similar effects in protecting streambank stability, shade, input of organic matter and woody material to streams for fish bearing streams. Since Alternative B has a narrow RMZ compared to Alternative C for perennial non-fish bearing streams (80 vs. 150 feet) there would be more potential for increases in fine sediment and loss of large woody material in these systems under Alternative B compared to Alternative C. Since Alternative C extends RMZs further from streams, more habitats for species that depend on both the aquatic and terrestrial ecosystems, such as amphibians, would be protected, enhanced, or restored.

Under Alternatives B and D, firewood cutting (of dead and down material less than 24 inches DBH) would be restricted adjacent to perennial and intermittent streams. This would maintain all snags and down trees within 100 feet of perennial and 50 feet of intermittent streams to protect large woody material. Alternatives B and D would provide more retention of woody material from firewood cutting in riparian areas compared to Alternative A, but less than under Alternative C.

Under Alternative B, up to 700 acres per decade of riparian vegetation could be actively restored or enhanced using a variety of treatment methods to reduce conifer encroachment, reduce noxious weeds, and promote vegetation diversity and vigor. Unlike Alternatives A and C, Alternative B would emphasize restoration or maintenance of aspen and cottonwood stands. Improvements to riparian vegetation would benefit fish and other aquatic organisms by stabilizing stream banks, reducing sediment delivery, increasing woody material, and providing desired water temperatures. Short term, minor effects, such as an increase of fine sediment, could occur during or immediately following riparian restoration activities. However, the long-term benefits to riparian and stream communities should outweigh the short-term effects. Alternative B would restore more riparian vegetation, including aspen stands, than Alternatives A and C but less than Alternative D.

Under Alternative B, there would be a schedule for exclosure maintenance but there would be no guarantee that exclosures would be in a functioning condition before annual livestock turn-out. This could result in damage and degradation of instream habitats, riparian areas, springs, as well as unique habitat types from cattle or other livestock use. Damage to instream and riparian habitats could be expected when exclosures are not maintained. The effects to riparian and stream habitats from livestock grazing would be the same as described under "Effects Common to All Alternatives." Alternative B would restore more acres of grasslands, shrublands, and forests and would have greater beneficial effects on overall watershed function than Alternatives C and A. Alternative B would restore fewer acres of vegetation than Alternative D. Although the long-term beneficial effects on watershed function could be less with Alternative B compared to Alternative D, there could be a greater amount of short-term adverse effects with the implementation of Alternative D.

Alternative B would allow timber salvage to occur outside of riparian areas. This alternative would maintain contiguous acres of undisturbed standing and down woody material. The management of dead and dying forests under Alternative B would provide protection to watershed function by maintaining blocks of undisturbed areas with down woody material and by restricting road construction. This would minimize sediment delivery and run-off to streams.

Assuming that the high end of the range of proposed weed treatments is implemented under any alternative, this alternative would restore the vigor, diversity, and distribution of riparian vegetation by reducing more acres of noxious weeds than Alternatives A and C but less than Alternative D. Although some new permanent roads would be allowed to be built for long-term forest management and mineral entry, both permanent and

temporary road construction would be kept to a minimum. Temporary roads would be decommissioned within one year of use. Alternatives B and C would protect streams and aquatic organisms from the detrimental effects of roads by; minimizing road locations in riparian areas, minimizing sediment delivery from road surfaces, outsloping road surfaces and minimizing disruption of natural hydrologic flow paths.

Managing for low road densities (less than 1 mi/mi^2) in big game winter range and grizzly bear distribution and managing for blocks of unroaded areas for elk security habitat would also improve overall watershed function as well as riparian and stream functions.

Since Alternative B would allow less livestock grazing than Alternatives A and D, this alternative could protect more riparian acres from the negative effects of livestock grazing (as described under "Effects Common to All Alternatives") than with Alternatives A and D. Because livestock grazing would be allowed on more acres than Alternative C, there would be more risk of impacts to riparian areas under Alternative B compared to Alternative C.

Unlike Alternative A, delivery of chemical retardants to perennial or fish bearing streams would be avoided during wildland fire suppression under Alternative B. Fire retardants can be lethal to aquatic organisms or result in decreases in species richness and diversity. Fish screens would be required under Alternatives B and C when using hoses to remove water in fish bearing streams during fire suppression activities. This would prevent direct mortality to fish.

As **Table 4-11** indicates, ACEC designations under Alternative B would have 30.6 miles of fish bearing streams. Alternative B would have a similar number of miles as Alternative C but would provide 19.2 more miles of fish bearing stream than Alternative A and 9.1 miles more than Alternative D. The ACEC designations under Alternative B would guarantee continued or additional protection to fish and other aquatic species by maintaining or restoring riparian and instream habitats and by protecting or restoring habitat at the landscape scale (reducing road density or restoring upland vegetation).

Two river segments would be recommended for inclusion in the National Wild and Scenic Rivers System; Muskrat Creek and the Missouri River below Hauser Dam. The goal of the Wild and Scenic River System is to preserve the character of rivers, ensure that rivers remain free flowing, and protect outstandingly remarkable values (ORVs). The ORV identified for Muskrat Creek was its restored population of westslope cutthroat trout while the ORVs for the Missouri River were identified as recreation (including recreational fisheries), scenic, and wildlife values. Unlike Alternative A, Alternative B would not protect ORVs for Moose Creek and the Upper Big Hole River because these two segments would not be recommended as suitable under this alternative.

All alternatives would have one stipulation to lessen the effects of oil and gas development on fish (stipulations that effect special status fish species are described under "Special Status Species"). Under Alternative B, this stipulation would be NSO within 0.5 mile of streams with Class 1 fisheries. With a NSO of 0.5 mile, approximately 30,500 acres adjacent to Class 1 streams would be protected from loss of riparian and stream habitat and chemical spills in the Decision Area.

Class 1 fish streams are found in three of the five areas with the most potential for oil and gas exploration and development (Sleeping Giant, Canyon Ferry, and Livingston).

Approximately 1,300 acres in the Sleeping Giant area along the Missouri River would be protected with the 0.5 mile NSO for Class 1 fisheries. This would be approximately 1,000 acres more than under Alternative A.

Approximately 750 acres in the Canyon Ferry area along the Missouri River would be protected with the 0.5 mile NSO for Class 1 fisheries. This would be approximately 600 acres more than under Alternative A.

Approximately 700 acres in the Livingston area along the Yellowstone River would be protected with the 0.5 mile NSO for Class 1 fisheries. This would be approximately 300 acres more than under Alternative A.

In the five areas with the most potential for oil and gas development, approximately 2,750 acres of Class 1 fisheries stream and riparian habitat would have some level of protection from loss of riparian and stream habitat and chemical spills. Since Alternative B would have move acres protected under a NSO, this alternative would provide more protection than Alternatives A and D, but less than Alternative C.

Effects of Alternative C

Like Alternative B, Alternative C would also establish additional protection to streams through Riparian Management Zones (RMZs). However, these RMZs would be wider under Alternative C than under Alternative B. These zones would differ in width by forested and non-forested habitat, stream type (fish-bearing, perennial or intermittent) and range from 50 feet for intermittent streams to 300 feet for fish bearing streams on either side of the stream (**Table 4-9** and **Table 4-10**). Riparian Management Zones under Alternative C would provide the most acreage where the management goals and objectives would be maintenance, restoration, and/or protection of riparian and stream habitats and functions of all alternatives (11,393 acres) (**Table 4-10**). This would be 53 percent more acres than under Alternative B and 70 percent more acres than under Alternatives A and D. The Upper Missouri and Big Hole watersheds would have the most acreage in RMZs (5,244 and 2,904 acres, respectively) under Alternative C.

This alternative would provide the most protection of all alternatives for fish and other aquatic organisms by only allowing activities in riparian areas that would restore or maintain riparian and stream habitats and functions. The width of these RMZs would ensure that the introduction of fine sediment would be negligible and the delivery of large woody material and organic matter would be maximized.

Under this alternative, certain management activities would be limited and only allowed when maintaining or restoring riparian and stream functions. No commercial product removal would be allowed but material could be used for restoration of other riparian or upslope habitats. Unlike the other action alternatives, Alternative C would emphasize "passive" restoration of riparian habitat, including aspen clones. Up to 200 acres of riparian vegetation could actively be restored per decade with this alternative (more could be done through other projects). Because restoration activities could occur in riparian areas and in streams, there could be short-term adverse effects to aquatic organisms from fine sediment or runoff but these effects would be anticipated to be negligible to minor. Alternative C would not actively restore as many acres of riparian habitats or miles of stream compared to Alternatives B and D.

Under Alternative C, firewood cutting would only be allowed in designated areas and no trees >20 inches DBH would be removed. Alternative C would designate the removal of firewood in areas to meet other resource objectives, such as the removal of conifer encroachment in aspen stands. This alternative would ensure that the most down woody material would be available to streams and riparian areas of all alternatives.

Alternative C would also emphasize "passive" restoration in upland vegetation. Due to this, Alternative C would actively restore the fewest acres of grasslands, shrublands, and forest habitats of all alternatives. Although short-term adverse effects would be the lowest under this alternative, this alternative could be the least effective at restoring overall watershed and stream functions.

Fewer acres of riparian vegetation would be treated to remove noxious weeds under Alternative C than under Alternatives B and D, but more than under Alternative A. Unlike all other alternatives, this alternative would not allow aerial application of herbicides. This would protect untargeted riparian vegetation more than the other alternatives but could also impede minimizing noxious weeds in riparian and upslope habitats that could ultimately lead to a decline of riparian and stream health and function.

As with Alternative B, the extent of timber removal with timber salvage projects would be restricted, but Alternative C would require the largest blocks (acres) of dead and dying forest be retained of all alternatives. Alternative C would provide the greatest protection to overall watershed function of all alternatives by maintaining the most down woody material and existing regenerating vegetation and by preventing soil disturbance and loss of microsites.

Under Alternative C, no new permanent roads would be constructed and temporary roads would be kept to a minimum and decommissioned after use. Road design criteria (same as Alternative B) would minimize disturbance in riparian areas, minimize sedimentation, and maintain natural flow regimes. Unlike all other alternatives, this alternative would require stream crossings to be able to withstand 100-year storm events, thus providing more protection to fish habitat in this context than the other alternatives.

Alternative C would reduce road densities in big game winter range and grizzly bear distribution more than all other alternatives. Managing for low road densities for wildlife would also contribute to Alternative C having the lowest overall road densities and greatest benefits to watershed function.

During wildland fire suppression, chemical retardants would only be used if there is a risk to human life and safety. This would protect aquatic organisms from direct mortality due to fire retardants and maintain species richness and diversity during wildland fires more than under the other alternatives.

As with Alternative B, fish screens would be used when removing water from streams during fire suppression to prevent direct mortality of fish.

Alternative C would potentially protect the most acres of riparian and stream habitats by allowing the fewest acres of livestock grazing. The effects to fish and aquatic resources from livestock grazing as described in "Effects Common to All Alternatives" would be less under Alternative C than all other alternatives.

Unlike Alternatives B and D, Alternative C would guarantee exclosures are maintained annually and before livestock turn-out. Although the other action alternatives would provide a maintenance schedule for exclosures, there would be no guarantee under Alternatives B and D that exclosures would be in a functioning condition before annual livestock use. Alternative C is the only alternative that would ensure protection of streams, riparian vegetation, and springs from livestock use. Damage to instream and riparian habitats could be expected when exclosures are not maintained. As **Table 4-11** indicates, ACECs under Alternative C would contain 32.9 miles of fish bearing stream. Although very similar to Alternative B, this alternative would protect the most mileage of fish bearing streams of all alternatives. Like Alternative B, the ACEC designations would guarantee continued or additional (in the case of the Elkhorn ACEC) protection to fish and other aquatic organisms by maintaining or restoring riparian and instream habitats and by protecting or restoring habitat at

the landscape scale (reducing road density or restoring upland vegetation).

Alternative C would have the most river segments recommended for inclusion under the National Wild and Scenic River System: Muskrat Creek, Moose Creek, Upper Big Hole, and Missouri River. Unlike the other alternatives, Moose Creek and the Upper Big Hole would also be protected from management activities that could change the outstanding and remarkable value of these river segments. Alternative C would provide protection to cutthroat trout in Moose Creek and Arctic grayling in the Upper Big Hole.

Alternative C would have the least negative impacts of all alternatives to fish and aquatic resources from mineral activities by not allowing new structures or roads within RMZs.

All alternatives would have one stipulation to lessen the effects of oil and gas exploration and development on fish (stipulations that effect special status species are described under "Special Status Fish Species"). Under Alternative C, this stipulation would be a NSO within 1 mile of streams with Class 1 fisheries. With a NSO of 1 mile, approximately 62,000 acres adjacent to Class 1 streams in the Decision Area would have a high level of protection from loss of riparian habitat, sedimentation to streams and from chemical spills.

Class 1 fish streams are found in three of the five areas with the most potential for oil and gas development (Sleeping Giant, Canyon Ferry, and Livingston).

Approximately 3,300 acres in the Sleeping Giant area along the Missouri River would be protected with the 1 mile NSO for Class 1 fisheries. This would be approximately 3,000 acres more than under Alternative A and 2,000 more acres than Alternative B.

Approximately 3,200 acres in the Canyon Ferry area along the Missouri River would be protected with the 1 mile NSO for Class 1 fisheries. This would be approximately 3,100 acres more than under Alternative A and 2,450 more acres than Alternative B.

Approximately 1,400 acres in the Livingston area along the Yellowstone River would be protected with the 1 mile NSO for Class 1 fisheries. This would be approximately 1,000 acres more than under Alternative A and 700 acres more than Alternative B.

In the five areas with the most potential for oil and gas development, there would be roughly 7,900 acres of Class 1 fisheries stream and riparian habitat with a high level of protection. Since Alternative C would have the most acres under a NSO (1 mile), this alternative would provide the most protection to riparian and stream habitat as well as to overall watershed function of all the alternatives.

Effects of Alternative D

As with Alternative A, riparian areas would only be protected by Streamside Management Zones under Alternative D. The SMZ would be 50 feet on both sides of the centerline of the stream (**Table 4-9**). The SMZ would provide some protection to fish and aquatic organisms and would have the same effects as described under "Effects Common to All Alternatives" and "Effects of Alternative A."

Alternative D would provide the fewest acres of riparian protection of the action alternatives but the same acreage (3,528 acres) as Alternative A (**Table 4-9** and **Table 4-10**). Since Alternatives D and A would have fewer acres adjacent to streams and wetlands with restrictions on the type and extent of management activities, there would be more negative effects to streams and aquatic species from fine sediment, increased runoff and nutrients, and loss of large woody material compared to Alternatives B and C.

Under Alternative D, up to 1,200 acres per decade of riparian vegetation could be actively restored through mechanical treatments. Alternative D could potentially restore the most acres of riparian habitat of all alternatives. However, since Alternative D would focus on a more narrow area adjacent to streams compared to Alternatives B and C, restoration of riparian areas would not be as effective under Alternative D compared to Alternatives B and C. The treatment of more riparian acres under Alternative D would result in more short-term effects from increased sedimentation and runoff than with the other alternatives.

The effects from firewood cutting in riparian areas would be the same as Alternative B.

Alternative D would restore the most acres of grasslands, shrublands, and forests. Although this would re-establish more historic vegetation conditions and move towards restoring overall watershed health and function, the number of roads and disturbance necessary to conduct vegetation treatments would have more short-term effects than under Alternatives B and C but less than under Alternative A.

Alternative D would maintain blocks of dead and dying forest from timber salvage operations but fewer acres would be maintained than under Alternatives B and C. Of the action alternatives, Alternative D could have the most detrimental effect on watershed, stream and riparian functions due activities associated with salvage harvest such as the loss of regeneration, loss of large woody recruitment and increased sedimentation and runoff to streams.

Alternative D would treat and reduce the most acres of noxious weeds of all the alternatives. This would restore the health and vigor of riparian vegetation on more acres than under all other alternatives. Of the action alternatives, the negative effects due to road construction and

use (as described under "Effects Common to All Alternatives") would be greatest and the beneficial effects less under Alternative D due to larger acres of vegetation treatments, smaller SMZs, fewer acres with low road density to protect big game winter range and security habitat and fewer roads closed or decommissioned through travel planning. Alternative D, however, would have fewer negative effects and greater beneficial effects than Alternative A. This alternative would also provide road design criteria to minimize impacts in SMZs and to minimize sediment delivery to streams. The road design criteria under Alternative D would be less restrictive and allow more detrimental effects to fish and aquatic habitats than those proposed under Alternatives B and C.

As with Alternative B, wildland fire suppression activities would avoid delivery of retardant to streams but unlike Alternatives B and C, Alternative D would not require fish screens be used when removing water from fish bearing streams (same as Alternative A). This could cause direct mortality of fish, including special status species.

Alternative D would allow the same amount of livestock grazing as under Alternative A and the effects would be the same as those described under "Effects of Alternative A." Exclosures would not be maintained annually and the potential of livestock damaging riparian and aquatic habitats from non-functioning exclosures would be greater under Alternatives D, B, and A than under Alternative C.

ACEC designations under Alternative D would contain 21.5 miles of fish bearing stream (**Table 4-11**). Alternative D would protect almost 10 miles of additional habitat compared to Alternative A, 9.1 fewer miles than Alternative B, and 11.4 fewer miles than Alternative C.

Unlike Alternatives B and C, this alternative would only protect 2.7 miles of fish bearing stream in the Elkhorn Mountains (11.8 miles under Alternative B and 13.7 miles under Alternative C). The ACEC designations under Alternative D would guarantee continued or additional protection to fish and other aquatic species over Alternative A by maintaining or restoring riparian and instream habitats and by protecting or restoring habitat at the landscape scale (reducing road density or restoring upland vegetation).

Under Alternative D no river segments would be recommended for inclusion in the National Wild and Scenic River System. There would be no benefits to fish and aquatic resources from this designation under Alternative D.

Like Alternative A, this alternative would allow new and existing mineral operations to have support facilities, including roads, in SMZs. Unlike Alternative A, this alternative would require facilities to be removed when no longer necessary. Alternative D would have similar detrimental effects due to mineral exploration and development as Alternative A and greater impacts than Alternatives B and C.

All alternatives would have one stipulation to lessen the effects of oil and gas exploration and development on fish (stipulations that effect special status fish species are described under "Special Status Species"). Under Alternative D, this stipulation would be CSU within 0.5 mile of streams with Class 1 fisheries. With a CSU of 0.5 mile, approximately 30,500 acres adjacent to Class 1 streams would have some level of protection from loss of riparian habitat, sedimentation, and chemical spills in the Decision Area.

Class 1 fish streams are found in three of the five areas with the most potential for oil and gas development (Sleeping Giant, Canyon Ferry, and Livingston).

Approximately 1,300 acres in the Sleeping Giant area along the Missouri River would be protected with the 0.5 mile CSU for Class 1 fisheries. Alternative D would have the least amount of guaranteed protection to streams and riparian habitats from oil and gas exploration and development of all the alternatives. Under this alternative, some use and occupancy would be allowed but the type and extent of use would be limited.

Approximately 750 acres in the Canyon Ferry area along the Missouri River would be protected with the 0.5 mile CSU for Class 1 fisheries.

Approximately 700 acres in the Livingston area along the Yellowstone River would be protected with the 0.5 mile CSU for Class 1 fisheries.

In the five areas with the highest potential for oil and gas exploration and development, there would be roughly 2,750 acres adjacent to streams that would have some level of protection. The level of protection under Alternative D would be less than under the other action alternatives because under a CSU, oil and gas exploration and development could occur. Although the type and extent of exploration and development could be modified to protect Class 1 fisheries, under this alternative there could be detrimental effects to streams and riparian habitats from loss of habitat due to exploration, drilling, roads and other activities related to oil and gas development.

Special Status Species

Because of the programmatic nature of the proposed alternatives, qualitative effects from management activities on special status ecosystems are addressed under "Effects Common to All Alternatives." Some effects may vary due to the degree of an activity such as the amount of vegetative treatments or road closures. These "quantitative" effects are addressed under each alternative. More specific analysis would be required to determine the extent of potential impacts from site specific management actions. This analysis would be completed when a management action is clearly defined.

Proposed management of the following resource programs would have no anticipated impacts to special status species; Air Quality, Paleontology, Cultural Resources, Visual Resources, Economics, and Environmental Justice.

Nearly all the effects identified in the Wildlife and Fish sections would be the same for special status species. For more analyses and discussion on how the proposed treatments would impact wildlife, fish, (including special status species) or plant species within the Decision Area, see their respective sections.

There are approximately 652,194 acres of federal mineral estate lands potentially available for oil and gas exploration and development in the Decision Area. Actual acreages available vary based on proposed stipulations by alternative. In the Decision Area, five areas have been identified with the most potential for oil and gas exploration and development (low to moderate potential overall) where there would most likely be reasonably foreseeable development and drilling activity (**Appendix M**). The five areas are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. The total area within these five areas is roughly 116,295 acres. Each of the five areas ranges in size from 1,550 to 53,370 acres.

Planning Area-wide, it is estimated that a total of 19 oil and gas wells (not including "step-out" wells) could be drilled, most likely within the five areas with the most potential over 15-20 years, but that only six of the 19 wells would produce oil or gas. A total of seven producing wells (including step-out wells) are forecast to be located on BLM mineral estate lands.

Effects Common to All Alternatives

Wildlife

The effects described under the general "Wildlife" section would apply to special status wildlife in the Decision Area.

All management actions would promote conservation of special status and priority wildlife species and their habitats and emphasize maintaining and supporting healthy, productive, and diverse populations and communities of native wildlife.

The implementation of habitat improvement projects would address declining habitat conditions and aim to stabilize and improve sensitive species' breeding, foraging and security habitats.

The Management Plan and Conservation Strategies for Sage Grouse in Montana (MSGWG 2005) states that human activities, including flushing birds during nesting and brood rearing by vehicles, could lead to mortality from predation, accidents, or other proximal causes. Disturbance near leks may disrupt breeding and cause birds to abandon traditional breeding sites, or reduce breeding success for that year. Disturbance within nesting areas may cause destruction or abandonment of nests; resulting in no hatch. Management activities in sage grouse habitats would be designed and implemented to be consistent with the National and Montana conservation strategies and guidelines, when appropriate, which would ensure all management activities protect sage grouse as well as habitat for other sagebrush obligate species. Following the National and Montana conservation strategies and guidelines would ensure that all projects would retain sufficient sagebrush densities for sagebrush obligate species, including sage grouse. This, along with the use of timing restrictions, would protect sage grouse breeding, foraging and security habitats. Implementation of the National and Montana conservation strategies and guidelines would have a beneficial effect to sage grouse and other sagebrush dependant species.

Implementation of current and future recovery plans for listed threatened and endangered species would ensure that the BLM is managing these special status species in a manner that is consistent with the Endangered Species Act. The BLM would conserve special status species and the ecosystems that they depend upon and would provide habitat for healthy, productive populations of special status species.

The restorative treatments in dry forest types would mimic natural fire and improve habitat for those special status species dependent on mature, open stands of ponderosa pine and Douglas-fir forests (refer to "Effects Common to All Alternatives" in the general Wildlife section). Over the long-term, treatments would result in greater acres of large, mature trees with open canopies and a diversity of understory grasses, shrubs, forbs and trees. The management of mature dry forests would increase habitat for special status species such as the flammulated owl, northern goshawk, great gray owl, migratory birds, long-eared myotis, long-legged myotis, and fringed myotis by increasing tree size, reducing the density of trees and by providing a snag and down wood component.

Uneven-aged management within cool, moist forests would focus on reduction of stem density and creating small openings that would be beneficial to many of the special status species that occur in this vegetation community. Creation of small openings would increase vegetation diversity and available forage, especially for species such as the Canada lynx. Cool forests would also be thinned, when necessary, to promote old forest characteristics and provide habitat diversity. This would improve forage and breeding habitat for special status species such as the northern goshawk, lynx, grizzly bear, and wolverine.

Reduction in tree densities and restoration of forest habitats would move vegetation towards historic conditions and increase the quality and quantity of breeding, foraging and hiding cover for a variety of special status species. Short-term disturbance and displacement of

special status species could occur during project implementation and treated areas may be temporarily avoided. However, it is expected that the long-term benefits to a wide variety of species from restoring vegetative communities would outweigh the short-term negative effects.

A change in vegetation density could reduce the amount of habitat available for certain species while increasing habitat for others. During project planning, the effects of treatments at the landscape scale would be addressed to determine the change in habitats, special status species affected, short and long-term effects to species and their habitats, the percent of habitat change across the landscape and which special status wildlife species would benefit or be negatively impacted from treatments.

The use of commercial and non-commercial timber harvest to meet vegetation restoration goals and objectives would benefit special status species dependent on forest habitats by improving habitat and restoring diversity.

Reducing the amount of forest subject to severe, uncharacteristic wildfire events as well as epidemic outbreaks of insects and disease would reduce the loss of large areas of habitat. Epidemics of insects and disease can have long-term negative impacts to some species while those species dependent on dead and dying forests, such as black-backed and three-toed woodpeckers, would benefit from increased foraging and breeding habitat.

Timber salvage would result in the loss of habitat for special status species that depend on dead and dying forests. Maintaining patches of dead and dying forest would help to retain habitat features for these species but the effects to snag dependant species would vary greatly depending on the size of patches remaining after salvage. The negative effects to breeding and foraging habitats used by special status wildlife species from timber salvage could be minor to major and long-term.

Treatment of grasslands and shrublands to create pre-fire suppression conditions, with an emphasis on reducing conifer encroachment, would restore and maintain habitat for the golden eagle, Brewer's sparrow, Swainson's hawk, ferruginous hawk, sage grouse, pygmy rabbit, sage thrasher, sage sparrow, mountain plover, long-billed curlew and black-tailed prairie dog (see "Wildlife Effects Common to All Alternatives"). Short-term disturbance and displacement could occur during project implementation and treated areas may be temporarily avoided. However, it is expected that the long-term benefits to a wide variety of special status species from restoring grasslands and shrublands would outweigh the short-term negative effects.

The effects of riparian treatments and management would be the same as described in "Effects Common to All Alternatives" in the general Wildlife section. Because of the unique nature of riparian areas and the crucial habitat they provide, almost all special status wildlife species could be impacted by management of these areas. By reestablishing native vegetation, reducing conifer encroachment (in non-forested areas) and reducing the effects of livestock grazing in riparian areas, breeding, foraging and hiding habitat along with movement corridors for all special status species would be improved.

Permanent and temporary roads associated with management could increase public access and decrease the quantity and quality of habitat for special status species. Permanent and temporary roads could negatively impact special status species, particularly if roads are open during critical periods such as during the winter in lynx habitat and during the summer within occupied grizzly bear habitat. Roads can encourage the public to recreate in areas that had formerly been secluded. Roads can cause direct mortality through road kill, prevent wildlife movement, create disturbance, cause the spread of noxious weeds, and cause habitat fragmentation across the landscape.

The effects of livestock grazing and noxious weed management on special status wildlife species would be the same as described under "Effects Common to All Alternatives" in the general Wildlife section.

Wilderness Study Areas (WSAs) provide undisturbed habitat that is important for special status species, particularly, species that are sensitive to disturbance and have large home ranges (i.e. grizzly bears, lynx, bald eagle, northern goshawk, and migratory birds). Wilderness Study Areas also provide large blocks of habitat for connectivity and movement corridors for many species.

The Sleeping Giant ACEC provides important habitat for numerous wildlife species. One of the primary objectives of this ACEC is to preserve, protect, and promote wildlife and habitats for "key" species including elk, bighorn sheep, mountain goat, osprey, bald eagle, peregrine falcon, waterfowl, and cold water fish. Continued management of the Sleeping Giant ACEC would ensure that crucial wildlife habitat for the above mentioned species, as well as for other special status species, would be maintained for the long-term.

The implementation of Suggested Practices for Raptor Protection on Power Lines (APLIC 1996) would ensure that impacts, including direct mortality to migratory and resident birds and bats would be avoided. Implementation of wind energy guidelines as defined in the Wind Energy Development Programmatic EIS would also help to protect special status species by minimizing the impacts (such as bird and bat strikes of turbines and associated infrastructure) of wind energy development.

The way bald eagles respond to human activities varies depending on the site, pair, and type of activity. The type, intensity, and proximity of disturbance to occupied habitat all determine how eagles respond.

Where there are priority species or their habitats, special measures may need to be applied to prevent impacts

associated with mineral and geophysical exploration. The effects to special status wildlife species from mineral exploration and development would the same as described under "Effects Common to All Alternatives" in the general Wildlife section.

Breeding, foraging, security and migration habitats for special status species could be directly lost from oil, gas, and mineral extraction activities due to the construction of wells, well pads, roads, pipelines, powerlines, buildings, and mine sites. Construction and implementation activities could also cause special status species to be displaced, preventing use of previously occupied habitats. Access roads could disturb and displace special status species, especially during critical seasons such as breeding or overwintering. The effects from oil, gas, and mineral development to special status wildlife species could be long-term and major at the site specific scale. However, due to the projected number of wells at the Planning Area scale (31) along with the use of stipulations, the effects from oil and gas development is expected to be minor to moderate in the Planning Area. Effects from hard rock mineral extraction, however, could be long-term and major at the Planning Level Scale depending on the location, the size of development and the extent of time mining occurs.

Oil and gas exploration and development would comply with appropriate stipulations and terms and conditions at the time of leasing. This would help to ensure that impacts to special status species are considered and avoided when possible.

Under all alternatives, there would be 12 stipulations to lessen the effects of oil and gas development on special status species (stipulations that affect wildlife and fish are described under those sections) (**Table 4-12**). The stipulations would protect special status species to different degrees based on the type of stipulation. A No Surface Occupancy or No Lease stipulation would prevent the loss of breeding, foraging, security and migration habitats as well as prevent any type of disturbance associated with oil and gas development. The more acres within a NSO or NL stipulation, the more overall protection a wildlife species (as well as other species) would have from oil and gas development. When comparing alternatives, those with more acres in NSO or NL would provide the least negative effects to wildlife.

Timing restrictions protect species during the crucial breeding season (such as bald eagles and sage grouse) and/or during the sensitive overwinter season (such as with sage grouse). As with NSO and NL stipulations, when comparing alternatives, the more acres within a timing restriction, the more a species would be protected from disturbance during crucial seasons of use. This should allow a species to reproduce and fledge young and/or increase the chance of surviving the winter season. This stipulation would only be applied during oil and gas exploration and habitat loss could still occur for those species with timing stipulations.

Controlled Surface Use (CSU) could provide the least protection to special status species because facilities associated with oil and gas exploration and development could replace habitat. Timing restrictions and surface use would vary by alternative.

Fish

The effects described under the Fish section would apply to special status fish in the Decision Area.

All alternatives would emphasize maintaining diverse, healthy, productive, and well distributed aquatic habitats and communities to increase populations of special status fish species.

The BLM would implement recovery and conservation plans for special status fish species. This would ensure that habitat for these species is protected, maintained, or restored. Management or conservation plans are currently in place for westslope cutthroat trout, Arctic grayling, and bull trout.

Plants

Native species are variable in their sensitivity to herbicides based on the type of herbicide applied, stage of growth of the plants, and timing of application. Often noxious weeds are treated early in the year before many native plants are actively growing and most sensitive to herbicide application or in late fall when many native plants are dormant and relatively insensitive to herbicide effects. Treatments of noxious weeds with biological control agents could also affect some native species, usually those most closely related to the species targeted for biological control. There have been incidents where biological control agents have attacked non-target species reducing their vigor and viability. Effects on non-target plants may reduce the densities on treated sites; however, no non-target species would be eliminated from treated sites.

Generally, treatments would promote desirable native species because noxious weeds compete with and displace many native species in infested areas.

Use of prescribed fire, timber harvest, and mechanical methods to create a mosaic of multiple successional stages would open forest canopies thus increasing habitat diversity for special status species.

Field inspections and population monitoring of special-status plants would protect populations by refining grazing management, weed control and other activities that are potentially damaging to special-status species.

Development of habitat management plans and conservation strategies for special-status plants would help maintain population viability and reduce the probability that management actions would reduce the distribution of desirable populations.

Table 4-12
Oil and Gas Stipulations and Acres Protected for Special Status Wildlife Species Decision Area-wide and in the Five Areas of Most Potential for Oil and Gas Development

Resource	Alternative A	Alternative B	Alternative C	Alternative D
Bald Eagle Nest Site (DA Acres) (5 Area Acres)	NSO ½ Mile 2,600 acres 1,110 acres	NSO ½ Mile 2,600 acres 1,110 acres	NL 1 Mile 9,540 acres 4,330 acres	NSO ½ Mile 2,600 acres 1,110 acres
Bald Eagle Breeding Habitat (DA Acres) (5 Area Acres)	TL 2/1-8/31 (1 Mile) 9,500 acres 3,150 acres	TL2/1-8/31 (1 Mile) 9,500 acres 3,150 acres	NL 1 Mile Same Area covered as Bald Eagle Nest Sites	TL 2/1-8/31 (1 Mile) 9,500 acres 3,150 acres
Ferruginous Hawk Breeding Territories (DA Acres) (5 Area Acres)	NSO ¼ Mile 0 0	NSO ½ Mile 0 0	NSO ½ Mile TL 3/1-8/31 (1 Mile) 0 0	TL 3/1-7/31 (1 Mile) 0 0
Peregrine Falcon Nest Sites (DA Acres) (5 Area Acres)	NSO ¼ Mile 240 acre 11 acres	NSO 1 Mile 3,820 acres 90 acres	NL 1 Mile 3,820 acres 90 acres	NSO 1 Mile 3,820 acres 90 acres
Other Raptor Nest Sites (DA Acres) (5 Area Acres)	NSO ¼ Mile 2,200 acres 460 acres	TL 3/1-7/31(1/2 Mi.) 7,400 acres 1,830 acres	NL ½ Mile 7,400 acres 1,830 acres	SLT
Prairie Dog Towns (DA Acres) (5 Area Acres)	NSO ¼ Mile 0 acres 0 acres	NSO 0 acres 0 acres	NSO 0 acres 0 acres	NSO 0 acres 0 acres
Sage Grouse Leks (DA Acres) (5 Area Acres)	NSO 500' 0 0	NSO ¼ Mile 0 0	NL ½ Mile 0 0	NSO ¼ Mile 0 0
Sage Grouse Breeding Habitat (DA Acres) (5 Area Acres)	TL 3/1-6/30(1/2 Mile) 0 0	TL 3/1-6/30 (3 Miles) 2,800 0	NSO 3 Miles 2,800 0	TL 3/1-6/30 (3 Miles) 2,800 0
Sage Grouse Winter/ Spring Range (DA Acres) (5 Area Acres)	TL 12/1-5/15 67,000 acres 43 acres	TL 12/1-5/15 67,000 acres 43 acres	NL 67,000 acres 43 acres	TL 12/1-5/15 67,000 acres 43 acres
Gray Wolf Den/ Rendezvous Sites (DA Acres) (5 Area Acres)	CSU 1 Mile 700 acres 0 acres	TL 4/15-6/30 (1 Mile) 700 acres 0 acres	NSO 1 Mile 700 acres 0 acres	CSU 1 Mile 700 acres 0 acres
Grizzly Bear Recovery Zone (DA Acres) (5 Area Acres)	CSU 7,400 acres 0 acres	NSO 7,400 acres 0 acres	NSO 7,400 acres 0 acres	CSU 7,400 acres 0 acres
Grizzly Bear Distribution Zone (DA Acres) (5 Area Acres)	CSU 54,000 acres 4,000 acres	TL 4/1-6/30 TL 9/15-10/15 54,000 acres 4,000 acres	NSO 54,000 acres 4,000 acres	CSU 54,000 acres 4,000 acres

Leasing solid and fluid minerals and geothermal resources, and mineral exploration and development could lead to disturbances and removal of special-status species during exploration and development.

Field inspections prior to authorized surface disturbing activities would reduce the possibility of special status plant habitat or population loss.

Oil and gas controlled surface use leasing restrictions would protect special status plant habitat in all alternatives.

Effects of Alternative A

Wildlife

Vegetation types within the Decision Area are represented by grassland, shrubland, dry forest, wet forest, and riparian. Dry forest is the most dominant forest type and represents 38 percent (115,000 acres) of all vegetation communities. Dry forests are currently well outside the historic average of natural variability due to fire suppression and heavy historic grazing. The effects on special status wildlife species from treatments under Alternative A in dry forest would be the same as described under "Effects of Alternative A" of the general Wildlife section. Alternative A would have fewer benefits from restoring dry forest habitats for migratory birds, northern goshawk, flammulated owl, long-legged myotis, long-eared myotis, and fringed myotis in comparison to Alternatives B and D, but would restore more acres than Alternative C.

Cool, moist forest comprises only about 7 percent (20,200 acres) of the total amount of vegetation in the Decision Area and is close to being within the range of natural variability. The effects on special status wildlife species from treatments under Alternative A in cool, moist forest habitats would be the same as described under "Effects of Alternative A" in the general Wildlife section. Alternative A would have fewer benefits from treatments in cool, moist forests for migratory birds, lynx, fisher, wolverine, and bats species in comparison to Alternatives B and D, but would restore more acres than Alternative C.

Alternative A provides no retention guidelines or recommendations for restoration of snag and down woody habitat (described under "Effects of Alternative A" in the general Wildlife section). This alternative could result in a decline of habitat for those special status species (black-backed and three toed woodpeckers, long-eared myotis and long-legged myotis) dependent upon dead and dying trees for breeding, foraging or denning habitat, and could have major and long-term negative effects. The lack of restrictions on maintaining or restoring snag and down woody habitats could have long-term detrimental effects on a variety of special status species that use these habitats.

Grassland vegetation represents approximately 45 percent of the total available habitat in the Decision Area. Sagebrush shrublands only represent roughly 7 percent of the total available habitat within the Decision Area but provide crucial habitat for sagebrush obligate species. The quality and quantity of grasslands and shrublands is declining due to fire suppression and heavy historic livestock grazing.

Under Alternative A, the effects on special status wildlife species from treatments in grasslands and shrublands would be the same as described under "Effects of Alternative A" in the general Wildlife section. Alternative A would have fewer beneficial effects from restoring grasslands and shrublands (Alternative A would not propose restoration of sagebrush shrublands) for migratory birds, golden eagle, ferruginous hawk, Swainson's hawk, long-billed curlew, Brewer's sparrow, mountain plover, sage grouse and pygmy rabbit in comparison to Alternatives B and D, but would restore more acres and have more benefits than Alternative C.

Noxious weed management would have minimal negative impacts on special status species but could provide substantial beneficial effects. The effects on special status wildlife species from noxious weeds would be the same as described under "Effects of Alternative A" in the general Wildlife section. Fewer acres of noxious weeds would be treated under Alternative A compared to Alternatives B and D but more than Alternative C. This could result in more loss of habitat for special status species under Alternative A than Alternatives B and D but less loss of habitat than under Alternative C.

Under Alternative A, the implementation of the Streamside Management Zones (SMZs) would result in smaller areas of riparian habitat being managed for the benefit of riparian habitats than under Alternatives B and C but the same as Alternative D. Smaller riparian management areas proposed under Alternatives A and D, along with the types and extent to management activities allowed in SMZs, could reduce breeding, brood rearing and foraging habitat as well as reduce the quality and quantity of movement corridors for the majority of special status species. The effects would be the same as described under "Effects Common to All Alternatives" and "Effects of Alternative A" in the general Wildlife section. Alternative A would also actively restore the least amount of riparian vegetation in comparison to the action alternatives. Riparian areas provide crucial habitat and critical travel corridors for special status species found in the Decision Area including but not limited to; grizzly bears, lynx, migratory and resident birds, raptors, bats and boreal toads.

Alternatives A and D would not utilize timing restrictions to protect breeding migratory and resident birds during prescribed burning or mechanical treatments. Because prescribed burning and mechanical treatments could occur during the breeding season, these alterna-

tives could have the greatest loss of migratory and special status resident.

There would be substantially more miles of open roads under Alternative A compared to the action alternatives. The effects of roads on special status species would be the same as described under "Effects Common to All Alternatives" and "Effects of Alternative A" in the general Wildlife section. High open road densities under Alternative A could result in the loss of year-round habitat and migration corridors, disturbance and displacement of wildlife, road kill and fragmentation of habitat. Special status species that are especially sensitive to roads include (but are not limited to) grizzly bear, lynx, wolverine and some raptors. The detrimental effects of open road densities to special status species under Alternative A could be minor to major and long-term.

High densities of open roads can impact the quality and quantity of grizzly bear habitat. Research has indicated that grizzly bears underutilize habitat near roads and other human activities (Mace et al. 1996; McLellan and Shackleton 1989). Restricting motorized access can aid in minimizing negative impacts on bears related to disturbance and interactions with humans. Under Alternative A, road densities within occupied grizzly bear habitat of the Lewis and Clark County NW TPA in both the Planning and Decision Areas would be higher than under the action alternatives. Alternative A would have the least amount of closed roads compared to the action alternatives and would have the most negative effects to occupied grizzly bear habitat of all the alternatives. See the Wildlife discussion in the Lewis and Clark County NW TPA section later in this chapter for more details.

The negative effects related to mineral development, including oil and gas, would be the same as described under "Effects Common to All Alternatives" and "Effects of Alternative A" in the general Wildlife section.

All alternatives would have 12 stipulations to lessen the effects of oil and gas development on special status species (stipulations that affect wildlife are described in the general "Wildlife" section) (**Table 4-12**).

Under Alternative A, these stipulations would include: NSO around bald eagle nests, peregrine falcon nests, other raptor nests, and sage grouse leks; timing restrictions in bald eagle breeding habitat and sage grouse winter, spring and breeding habitat; and controlled surface use in grizzly bear habitat and around gray wolf den sites. A No Surface Occupancy stipulation would prevent the loss of breeding, foraging, security and migration habitats as well as prevent any type of disturbance associated with oil and gas development. The more acres within a NSO stipulation, the more overall protection a wildlife species (as well as other species) would have from oil and gas development. When comparing alternatives, those with more acres in NSO provide the least negative effects to wildlife. Timing restrictions protect species during the crucial breeding season (such as bald eagle and sage grouse) and/or during the sensitive overwinter season (such as with sage grouse). As with NSO stipulations, when comparing alternatives, the more acres within a timing restriction, the more a species is protected from disturbance during crucial seasons of use. This stipulation is only for oil and gas exploration and habitat loss could still occur for those species with timing stipulations.

There are approximately 652,194 acres of federal mineral estate lands in the Decision Area. In the Decision Area, five areas have been identified with the most potential for oil and gas exploration and development (low to moderate potential overall) where there would most likely be reasonably foreseeable development and drilling activity (**Appendix M**). The five areas are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. The total area within these five areas is roughly 116,295 acres. Each of the five areas ranges in size from 1,400 to 50,600 acres.

The southern Deerlodge Valley area located north of Anaconda has approximately 8,700 acres of federal mineral estate with no BLM surface ownership within the area. There is currently one known bald eagle nest in this area but this nest is well outside of federal mineral estate lands. There are no known ferruginous hawk, peregrine falcon, or other raptor breeding territories in this area. There are no known sage grouse leks, sage grouse habitat, or prairie dog towns in this area. This area is not within the distribution or recovery zone of the grizzly bear and there are no known gray wolf den sites.

The Sleeping Giant area is located north of Helena and is approximately 47,000 total acres of federal mineral estate, of which approximately 22,000 acres are BLM surface lands. Currently, there are eight known bald eagle nests sites in this area and approximately 740 acres would be protected with a NSO stipulation. An additional 1,750 acres beyond the 0.5 mile bald eagle nest NSO would have a 2/1–8/31 timing restriction. There are no known ferruginous hawk breeding territories, sage grouse leks, sage grouse habitat, or prairie dog towns in this area. There is one known peregrine nest site in the vicinity but it is outside of federal mineral estate lands. Other raptor breeding territories (such as golden eagles) in the Sleeping Giant area would be protected with approximately 340 acres in a NSO stipulation with approximately one-half of these acres overlapping with the bald eagle stipulations. Approximately 2,600 acres are within the distribution of grizzly bear and would be protected with a CSU stipulation. Under a CSU, there could be exploration and development but with some restrictions. There are no known gray wolf den sites in this area.

The Canyon Ferry area is located in and around the town of Townsend and is the largest area with potential oil and gas development with approximately 51,000 acres of federal mineral estate. Approximately 35,000 acres of BLM lands (surface) have the potential for oil and gas development with the majority of the acres located in the

National Guard Firing Range. Currently, there are six known bald eagle nests in this area and approximately 330 acres would be protected with a NSO stipulation. An additional 1,100 acres beyond the 0.5 mile bald eagle nest NSO would be protected with a 2/1–8/31 timing restriction. There are no known ferruginous hawk nests, peregrine falcon breeding territories, sage grouse leks, sage grouse habitat, or prairie dog towns in this area. Other raptor breeding territories in the Canyon Ferry area would be protected with approximately 125 acres in a NSO stipulation. The area is not within the recovery zone or the distribution of the grizzly bear and there are currently no known gray wolf den sites.

The Bozeman area is located approximately 10 miles east of Bozeman and is approximately 1,400 acres of federal mineral estate. There are no BLM lands (surface) in this area. There are currently no known bald eagle nest sites, ferruginous hawk breeding territories, peregrine nests sites, sage grouse leks, sage grouse habitat, or prairie dog towns in this area. Approximately 1,300 acres are within the distribution of grizzly bear and would be protected with a CSU stipulation. Under a CSU, there could be exploration and development but with some restrictions. There are no known gray wolf den sites in this area.

The Livingston area is located immediately east of the town of Livingston and is approximately 8,450 acres of federal mineral estate. There are approximately 1,600 acres of BLM lands (surface) in this area. Currently, there are four known bald eagle nests in this area and approximately 40 acres would be protected with a NSO stipulation. An additional 300 acres beyond the 0.5 mile bald eagle nest NSO would have a 2/1–8/31 timing restriction. There are no known ferruginous hawk nests, other raptor nest sites, sage grouse leks, sage grouse breeding habitat, or prairie dog towns in this area. There are, however, approximately 43 acres within sage grouse winter and spring habitat that would be protected with a 12/1-5/15 timing restriction. There is one currently known peregrine breeding territory in the Livingston area that would be protected with approximately 11 acres in a NSO stipulation. Approximately 100 acres are within the distribution of grizzly bear and would be protected with a CSU stipulation. Under a CSU, there could be exploration and development but with some restrictions. There are no known gray wolf den sites in this area.

In the Decision Area, there would be 2,600 acres surrounding bald eagle nest sites that would be protected with a NSO stipulation under Alternatives A, B and D (0.5 mile from nest) (**Table 4-12**).

Three of the five areas with the most potential for oil and gas development have bald eagle nest sites (1,110 acres) that would be protected with the 0.5 mile NSO stipulation and an additional 3,150 acres beyond the NSO boundary would be protected with a timing restriction of 2/1-8/31 (Alternatives A, B and D).

Currently, there are no known ferruginous hawk nest sites within the Decision Area (including the five areas with the most potential). When located, Alternative A would protect the fewest acres from habitat loss with a ¼ mile NSO around nest sites compared to Alternatives B and C (1/2 mile NSO).

In the entire Decision Area, there would be 240 acres surrounding peregrine falcon nest sites protected with a NSO stipulation within 0.25 mile of nest sites. Alternative A would protect the fewest acres from habitat loss around peregrine falcon nest sites of all the alternatives. Only one of the of the five areas with the most potential for oil and gas development currently has a known nest site within surface or subsurface ownership and a total of 11 acres would be protected with a NSO of 0.25 mile surrounding the nest (**Table 4-12**).

In the entire Decision Area, there would be 2,200 acres of other known raptor breeding territories (such as golden eagles) protected with a NSO stipulation (0.25 mile from nest). Alternative A would protect more acres from habitat loss around raptor nest sites than Alternatives B and D. Only two of the five areas with the most potential for oil and gas development currently have other known raptor breeding territories that would be protected with the NSO (460 acres) (**Table 4-12**).

Currently, there are no known active prairie dog towns within the Decision Area (including the five areas with the most potential). When located, all alternatives would protect prairie dog towns with a NSO. When located, Alternative A would protect more habitat around prairie dog towns (for expansion of the town) with a NSO than the Action Alternatives.

Currently, there are no known sage grouse leks within the Decision Area (including the five areas with the most potential). When located, Alternative A would protect substantially fewer acres from habitat loss with a 500' NSO around leks compared to the Action Alternatives.

In the Decision Area there are approximately 67,000 acres within sage grouse winter and spring range that would be protected with a 12/1-5/15 timing restriction. Compared to Alternatives B and D, Alternative A would allow for more disturbance adjacent to sage grouse leks with a ½ mile timing restricting during the breeding season. Alternative A could have more negative effects on the reproductive capability of sage grouse than the Action Alternatives. One of the five areas with the most potential for oil and gas development has a small amount of known sage grouse winter or spring range (43 acres) that would be protected with the timing restriction under Alternative A (**Table 4-12**).

Currently in the Decision Area, there is only one known gray wolf den site. Approximately 700 acres would be protected around this den site with a CSU. Alternatives A and D would not fully protect the area surrounding dens because CSUs allow exploration and development with some limitations. However, none of the five areas

with the most potential for oil and gas development have known wolf den sites.

Decision Area-wide, there are approximately 7,400 acres in grizzly bear recovery areas and 54,000 acres within the range of distribution of grizzly bear that would be protected with a CSU stipulation. Alternatives A and D could protect fewer acres of grizzly bear habitat and could allow for more disturbance to this species than Alternatives B and C. Three of the five areas with the most potential for oil and gas development are within the distribution of grizzly bear (Sleeping Giant and Livingston) and approximately 4,000 acres would have limited protection with a CSU stipulation.

Fish

The effects described under "Effects Common to All Alternatives" and "Effects of Alternative A" in the general Fish section would be the same for special status fish species.

Under Alternatives A and D, riparian areas would only be protected with SMZs of 50 feet for fish bearing and non-fish bearing streams. Effects would be the same as described for Alternative A in the general Fish section. The type and extent of projects that would be allowed in riparian areas under Alternatives A and D would cause more negative effects to special status aquatic species from increased sedimentation, runoff and loss of riparian and instream habitats than under Alternatives B and C.

Of all alternatives, Alternative A would protect the fewest miles of habitat for special status fish (0 miles), associated with designation of ACECs.

All alternatives would have five stipulations to lessen the effects of oil and gas development on special status fish (other stipulations that generally affect fish are described in the general Fish section). Under Alternative A, these stipulations would include No Surface Occupancy (NSO) adjacent to Arctic grayling and westslope and Yellowstone cutthroat trout streams and Controlled Surface Use (CSU) adjacent to bull trout streams (**Table 4-13**).

In the Decision Area, five areas have been identified with the most potential for oil and gas exploration and development (low to moderate potential overall) where there would most likely be reasonably foreseeable development and drilling activity (**Appendix M**). The five areas are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. The total acreage within these five areas is roughly 116,295 acres. Each of the five areas ranges in size from 1,400 to 50,600 acres.

There is no habitat for Yellowstone cutthroat trout and Arctic grayling in the southern Deerlodge Valley and no known habitat for 90-100 percent genetically pure westslope cutthroat trout. Lost Creek, a bull trout stream, flows outside of the southern Deerlodge Valley area but when a CSU stipulation (0.5 mile on either side of stream) is applied, approximately 32 acres adjacent to this stream in subsurface ownership would have some degree of protection in the Deerlodge valley.

There is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout in the Sleeping Giant area and there is no known habitat for 90-99 percent genetically pure westslope cutthroat trout. However, there are approximately 330 acres adjacent to 99-100 percent genet-

Table 4-13
Oil and Gas Stipulations/Acreages Covered for Special Status Fish Species Decision Area-wide and in the Five Areas of Most Potential for Oil and Gas Development

Resource	Alternative A	Alternative B	Alternative C	Alternative D
Arctic Grayling (DA Acres) (5 Area Acres)	NSO ¼ Mile 13,000 acres 0 acres	NSO ½ Mile 27,400 acres 0 acres	NSO ½ Mile 27,400 acres 0 acres	CSU ½ Mile 27,400 acres 0 acres
Westslope Cutthroat Trout (90-99 % genetically pure) (DA Acres) (5 Area Acres)	NSO ¼ Mile 800 acres 0 acres	NSO ½ Mile 2,200 acres 0 acres	NSO ½ Mile 2,200 acres 0 acres	CSU ½ Mile 2,200 acres 0 acres
Westslope Cutthroat Trout (99-100 % genetically pure) (DA Acres) (5 Area Acres)	NSO ¼ Mile 4,900 acres 330 acres	NSO ½ Mile 11,000 acres 700 acres	NL ½ Mile 11,000 acres 700 acres	NSO ½ Mile 11,000 acres 700 acres
Yellowstone Cutthroat Trout (DA Acres) (5 Area Acres)	NSO ¼ Mile 2,600 acres 316 acres	NSO ½ Mile 7,100 acres 930 acres	NL ½ Mile 7,100 acres 930 acres	CSU ½ Mile 7,100 acres 930 acres
Bull Trout (DA Acres) (5 Area Acres)	CSU ½ Mile 4,000 acres 32 acres	NSO ½ Mile 4,000 acres 32 acres	NL1 Mile 9,200 acres 420 acres	NSO ½ Mile 4,000 acres 32 acres

ically pure westslope cutthroat trout streams in this area that would be protected with a NSO stipulation (0.25 mile on either side of the stream) (**Table 4-13**).

There is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout in the Canyon Ferry area and there is no known habitat for 90-100 percent genetically pure westslope cutthroat trout.
There is no habitat for Arctic grayling, bull trout, or habitat for 90-100 percent genetically pure westslope cutthroat trout in the Bozeman area. There would be approximately 3 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a NSO stipulation (0.25 mile on either side of the stream).

There is no habitat for Arctic grayling, bull trout, or habitat for 90-100 percent genetically pure westslope cutthroat trout in the Livingston area. There would be approximately 313 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a 0.25 mile NSO stipulation.

None of the five areas with the most potential for oil and gas development have habitat for Arctic grayling (**Table 4-13**). Elsewhere in the Decision Area, there would be 13,000 acres adjacent to streams with Arctic grayling that would be protected with a NSO stipulation under Alternative A (0.25 mile on either side of stream). Alternative A would protect substantially fewer acres adjacent to Arctic grayling streams from development due to oil and gas than Alternatives B and C but more than Alternative D.

Across the Decision Area, there would be 4,900 acres adjacent to streams with 99-100 percent genetically pure westslope cutthroat trout that would be protected with a NSO stipulation under Alternative A (0.25 mile on either side of stream). Alternative A would protect substantially fewer acres adjacent to westslope cutthroat trout (99-100 percent pure) streams from development due to oil and gas than the Action Alternatives.

Across the Decision Area, there would be 2,600 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a NSO stipulation under Alternative A (0.25 mile on either side of stream). Alternative A would protect substantially fewer acres adjacent to Yellowstone trout streams from development due to oil and gas than Alternatives B and C. Two of the five areas with the most potential for oil and gas development (Bozeman and Livingston) have habitat for Yellowstone cutthroat trout and approximately 316 acres adjacent to these streams would be protected with a NSO stipulation (**Table 4-13**).

Across the Decision Area, there would be 4,000 acres adjacent to streams with bull trout that would have a CSU stipulation under Alternative A (0.5 mile from either side of stream). Alternative A would protect substantially fewer acres adjacent to bull trout streams from development due to oil and gas than Alternatives B and C. One of the five areas with the most potential for oil and gas development (southern Deerlodge Valley) has habitat for bull trout and approximately 32 acres adjacent to these streams would be protected with a CSU stipulation.

Spills can be a major source of contamination in oil and gas producing areas. Oil partially consists of chemicals that can dissolve in water and exposure to these chemicals by fish and other aquatic species can result in death or disease. During oil and gas development, sediment can also be released into streams and rivers from road building, pipeline development, excavation, and site development. Sediments can increase the amount of stress that fish experience, disrupting feeding, growth, social behavior, and susceptibility to disease. Sediment can fill interstitial spaces and smother fish eggs and affect the survival of juvenile fish (Pembina 2006).

Seismic exploration uses a series of explosions to provide the shock waves necessary for companies to record the location of oil and gas. The detonation of explosives in or near water can damage fish swim bladders (the organ that keeps fish afloat), livers, kidneys, and spleens. The explosions can also change fish behavior and result in chemical and physical changes to aquatic habitat. Byproducts from the detonation of explosives can include ammonia or similar compounds that can be toxic to fish and other aquatic organisms.

The development of roads and other infrastructure to support the operation of oil and gas can also alter habitat, allow for an increase in runoff, and cause a spread in noxious weeds (that can reduce the quality and quantity of riparian vegetation).

Streams, rivers, and wetlands can be severely impacted by oil and gas development due to altered hydrology from changes in surface and subsurface drainage patterns. Soil compaction from construction can result in reduced infiltration rates of precipitation into the soil and groundwater, thereby increasing surface runoff as well as sediment load and potential contaminates to streams. Water removal during drilling or the disposal of produced water may alter the subsurface hydrology on which aquatic systems depend. Shallow groundwater can become contaminated from disposal or injection of produced water and could potentially negatively affect rivers, streams, wetlands, and those species dependent upon those habitats.

Although Alternative A does provide protection to streams with special status species from oil and gas development, there would still be a risk from contamination due to spills, water discharge, and sedimentation compared to the action alternatives. There would also be a much larger risk to fish and other aquatic species under Alternative A from a change in subsurface flow (due to directional drilling) that could reduce the quality or quantity of water within streams and rivers.

Under Alternatives A, B and D, Muskrat Creek would not have a mineral withdrawal on 180 acres of riparian

areas and would not be protected from direct effects of mining. The 180 acres proposed for the Muskrat/Nursery Creek withdrawal under Alternative C would provide the minimum amount of protection to water quality, stream morphology, and riparian function to protect the restored and unique population of westslope cutthroat trout. Alternatives A, B, and D would not necessarily protect the genetically pure westslope cutthroat trout population in Muskrat Creek. These alternatives could result in a loss of riparian vegetation, streambed and bank destabilization, erosion and sedimentation, loss of floodplain vegetation, alteration of floodplain morphology, and alteration of stream channel morphology that could occur in association with locatable mineral activity, particularly placer mining. Another key impact that placer mining (including casual use) could have on westslope cutthroat trout is excavation, crushing or disturbance of streambed gravels during the critical period when trout are spawning and eggs are incubating/hatching (approximately 6/1-8/31).

MFWP, BLM, USFS, and other entities are currently making efforts to restore westslope cutthroat trout (a sensitive species) populations in a portion of their historic, but currently unoccupied habitat in the Upper Missouri River basin. One goal of these efforts is to prevent a federal listing of this species under the Endangered Species Act. The Muskrat Creek westslope cutthroat trout population is used by MFWP as a donor source of fish to re-establish populations in other streams within and beyond the Planning Area boundaries. In this sense, the Muskrat Creek population is disproportionately important to westslope cutthroat trout restoration throughout the Upper Missouri River basin. If mining operations cause a decline in this population, the population may no longer be able to function as a donor source and efforts to restore other populations and prevent a federal listing of this species may be impeded.

Plants

Assuming that the low end of the range of proposed weed treatments is implemented under any alternative, under Alternative A, the least amount of noxious weed spread (43,000 acres) would occur; therefore the threat of special status plant habitat loss would be least for this alternative. If the high end of the range of proposed weed treatments is implemented under the action alternatives, the greatest amount of weed spread would occur under Alternative A. The protections afforded by SMZs for the forested riparian species Idaho sedge and small yellow lady's slipper would be less than the buffers in Alternatives B and C. Dry forest, shrubland and grassland treatments (10,350 acres per decade) to maintain or restore habitat of Lemhi penstemon, sapphire rockcress and lesser rushy milkvetch would be higher than under Alternative C, but less than under Alternatives B or D.

Oil and gas leasing NSO restrictions within 0.25 mile of known populations would protect them by decreasing the potential for disturbance. The most acres of the field office would be available for locatable mineral entry, causing this alternative along with Alternative D to have the highest possibility of habitat disturbance.

Effects Common to Action Alternatives

Wildlife

Effects described in "Effects Common to Action Alternatives" in the general Wildlife section would also apply to special status species.

All federally listed and BLM sensitive species and their habitats would be considered "priority" species and "priority" habitats. By designating these species and habitats as "priority", they would be given additional protection and consideration during project planning and implementation. Protection and maintenance of habitat would ensure special status species maintain viable and diverse populations and ensure short-term and long-term protection of wildlife species within the Decision Area. Protection of special habitat components such as caves and cliffs would maintain habitat for species such as bats and peregrine falcons.

Closing rock climbing in areas with active raptor nests would reduce disturbance and prevent nest abandonment to special status raptor species.

Virtually all bird species are susceptible to disturbance on nesting sites (Joslin et al. 1999). Raptors are susceptible to disturbance while nesting, and may abandon nests with eggs or chicks if the level of disturbance is unacceptable. Acceptable disturbance varies by species, but could cause the failure of nests, reducing the productivity of species already in decline. The use of timing restrictions for special status species during the breeding season would substantially increase the likelihood of nesting success.

Seasonal closures during winter and breeding seasons to protect special status bat species would limit disturbance and allow these species to conserve energy during critical times of their life cycle. Disturbance of bat hibernacula could cause bats to flee and expend valuable energy during the winter which could lead to mortality. Disturbance of maternity colonies could cause young bats to fall and be predated on. Installation of bat gates at abandoned mine sites with bat use would protect bats from disturbance, displacement and direct mortality.

Protection of wildlife linkage corridors would reduce isolation of individuals and improve gene flow and viability of many special status species populations. All projects would maintain connectivity and reduce fragmentation of habitat. This would allow special status species to maintain genetic flow across the Planning Area.

Complying with all standards and guidelines in the Canada Lynx Conservation Assessment and Strategy would protect Canada lynx habitat and ensure that the population of this species is maintained or increased over time.

Disturbance associated with projects in occupied grizzly bear habitat would be restricted. Bears that become habituated to human foods can pose a threat to humans in the area. Habituated bears often are moved to new locations or killed to prevent harm to humans. BLM would develop and implement food regulations and guidelines within occupied grizzly bear habitat, which would reduce grizzly bear/human interactions and protect bears from disturbance, displacement, or death.

All programs would be required to meet or move towards meeting Land Health Standards. This would minimize the negative impacts on special status species from all programs including but not limited to; vegetation management, range, mining, forestry, rights-of-way and energy development.

Dry forest treatments would be designed to mimic natural fire events and result in an increase of large mature trees with open canopies and a diversity of understory species. Uneven-aged management and retaining old forest structure within dry forest types would improve habitat for those special status wildlife species such as the northern goshawk and flammulated owl as well as other species that prefer mature forests of ponderosa pine and Douglas-fir forests.

Alternatives B, C, and D would emphasize restoration and protection of sagebrush habitat and maintain, to the extent possible, large patches of high quality sagebrush. The action alternatives would improve connectivity of habitat and would enlarge the size of sagebrush patches in occupied or historic sage grouse habitat. This would protect sage grouse, pygmy rabbits, other sagebrush obligates and all species that depend on or use sagebrush habitat. This would also allow for the potential expansion of sage grouse into currently unoccupied habitats.

Protection and restoration of riparian areas would maintain or improve breeding, foraging, hiding cover and migration corridors for bald eagles, Swainson's hawks, bats and lynx as well as the majority of other special status species.

High priority lands for retention and future acquisitions would include areas important to special status species including ACECs, Wild and Scenic River corridors, WSAs, and additional habitat for priority and special status species. This would ensure long-term protection and/or restoration of habitat important to special status species.

Fish

The BLM would work with MFWP to remove nonnative fish species to restore special status fish populations and increase the distribution of these species.

Habitat for westslope cutthroat trout, Yellowstone cutthroat trout, Arctic grayling, bull trout, and other native fishes would be enhanced or restored. Watershed restoration projects would be designed and implemented in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to meeting riparian goals and objectives.

All action alternatives would reduce the negative effects of the transportation system on special status fish species by removing barriers (when desirable), reducing sedimentation and restoring or maintaining riparian vegetation.

Plants

Oil and gas leasing would be subject to controlled surface use stipulations on special status plant habitat.

Effects of Alternative B

Wildlife

The effects of Alternative B on special status wildlife species would be the same as described under "Effects of Alternative B" in the general Wildlife section.

Vegetation types within the Decision Area are represented by grassland, shrubland, dry forest, wet forest, and riparian. Dry forest is the most dominant forest type and represents 38 percent (115,000 acres) all vegetation communities. Dry forest are currently well outside the historic average of natural variability due to fire suppression and heavy historic grazing. The effects on special status wildlife species from treatments under Alternative B in dry forests would be the same as described under "Effects of Alternative B" in the general Wildlife section. Alternative B would restore more dry forest habitat for migratory birds, northern goshawk, flammulated owl, long-legged myotis, long-eared myotis, and fringed myotis compared to Alternatives A and C but would restore fewer acres than Alternative D. The short-term impacts from disturbance would be more than with Alternatives A and C, but less than with Alternative D. It is expected that the long-term benefits of restoring habitat for dry forest species would outweigh any short-term impacts.

The effects on special status wildlife species from treatments under Alternative B in cool, moist forests would be the same as described under "Effects of Alternative B" in the general Wildlife section. Alternative B would restore more acres of cool, moist forest habitat for migratory birds, lynx, fisher, wolverine, and bat species compared to Alternatives A and C, but would restore fewer acres than Alternative D.

The BLM would use an existing protocol developed by the Forest Service to determining the range of natural conditions for snag habitat until additional studies are completed. This would provide criteria for determining how much snag habitat should be retained (or created) in different habitat types and would aid in assessing impacts to special status species associated with management actions.

Throughout the Decision Area, there are snag deficient areas due to past mining, firewood cutting and timber harvest. In these areas, snags would be targeted for creation. Within other forested stands in the Decision Area, snags have been created naturally through forest insects, disease, and fire. In these areas, blocks of dead and dying forests would be retained to provide habitat for snag dependant species while still allowing some commodity forest product removal.

The proactive creation of snags in snag deficient areas would improve habitat diversity, increase habitat for snag dependant species and improve species viability.

When timber salvage is proposed in dead and dying forests, Alternative B would maintain contiguous acres of undisturbed standing and down woody material in adequate amounts for those special status species that depend on this habitat type for breeding, foraging, and denning. This would protect snag habitat for a variety of snag dependent species including migratory and resident birds, raptors, bats, and three-toed and black-backed woodpeckers.

Where salvage would be allowed to occur, forest openings would be a size that is appropriate to the site and would include snag retention patches. Alternative B would protect more habitat for those special status species that depend on dead and dying forests than Alternatives A and D, but less than Alternative C.

Grassland vegetation represents approximately 45 percent of the total available habitat in the Decision Area and sagebrush shrublands represent roughly 7 percent. The quality and quantity of grasslands and shrublands is declining due to fire suppression, conifer encroachment, and noxious weed infestations.

Under Alternative B, the effects on special status wildlife species from restoration of grasslands and shrublands would be the same as described under "Effects of Alternative B" in the general Wildlife section. Alternative B would restore more grassland and sagebrush shrubland habitats for migratory birds, golden eagles, ferruginous hawks, Swainson's hawks, long-billed curlews, Brewer's sparrow, mountain plovers, sage grouse and pygmy rabbit compared to Alternatives A and C, but would restore fewer acres than Alternative D.

The effects on special status wildlife species from noxious weeds under Alternative B would be the same as described under "Effects of Alternative B" in the general Wildlife section. This alternative could result in an increase in the quality and quantity of habitat for special status species compared to Alternatives A and C.

Alternative B would reduce the risk of mortality to special status nesting birds, including migratory and resident birds, during prescribed fire by excluding the use of fire during the breeding season in areas that have substantial use by breeding birds. However, because other methods of vegetation treatments, such as mechanical, would not have timing restrictions, there could still be detrimental impacts to breeding birds under this alternative. Alternative B would protect breeding birds more than Alternatives A and D, but less than C (which would have timing restrictions for prescribed fire and mechanical treatments).

The limited amount of riparian habitat in the Decision Area and the substantial use these areas receive by special status species, makes this habitat type the most crucial to restore or protect. Riparian Management Zones (RMZs) would be established for this alternative that are wider than Alternatives A and D but narrower than Alternative C. These zones would vary from 50 feet (intermittent streams) to approximately 160 feet for fish-bearing streams Riparian Management Zones under Alternative B would provide more protection for terrestrial special status wildlife than SMZs alone (Alternatives A and D) by requiring all management activities restore or maintain riparian and stream function. The width of the RMZs would ensure that riparian habitat is maintained along streams not only for water quality and aquatic habitat but also for the numerous terrestrial wildlife species that use riparian areas for breeding, foraging, hiding cover and for movement corridors.

There would be fewer negative effects from a loss of large woody material, desired vegetation or movement corridors under Alternative B than with Alternatives A and D.

There would be substantially fewer miles of open roads under Alternative B compared to Alternative A. Alternative B would also have fewer open roads than Alternative D but more open roads than Alternative C. The effects of roads on special status species would be the same as described under "Wildlife Effects Common to All Alternatives" and "Effects of Alternative B" in the general Wildlife section. Open road densities under Alternative B would result in more year-round habitat and migration corridors and less disturbance and displacement of wildlife, road kill, and fragmentation of habitat compared to Alternatives A and D. The beneficial effects to special status wildlife from closing roads would be slightly less under Alternative B than under Alternative C.

Alternative B would prevent loss of habitat or disturbance in occupied grizzly bear habitat by allowing no net increase in permanent roads where open road densities are 1 mi/mi^2 or less in the distribution of grizzly bear. The BLM would also emphasize closing roads in occupied grizzly bear habitat where open road densities exceed 1 mi/mi^2.

Grizzly bears generally adjust to disturbance associated with roads by avoiding the area (Mace et al. 1996). This results in a reduction in the amount of habitat available to the bears. Roads also provide increased access into remote areas and encourage human settlement, recreational use, and other land uses. These activities can in-

crease the frequency of human/bear conflicts and ultimately reduce habitat availability and grizzly populations. By increasing and protecting low road density areas, Alternative B would provide more suitable habitat for grizzly bears than Alternatives A and D, but less suitable habitat compared to Alternative C.

Under Alternative B, there would be fewer acres open for cross-country snowmobile use (112,682 acres) than Alternatives A and D but more than Alternative C. The negative affects due to cross-country snowmobile use could include harassment of special status species during a season of high stress. This could cause individuals to leave an area (temporarily or permanently) and/or an increase in stress that could lead to mortality. Alternative B would have fewer detrimental effects to special status species from cross-country snowmobile use than Alternatives A and D, but substantially more than Alternative C.

Alternative B would improve habitat for special status bat species by retaining vegetation around caves and abandoned mines occupied by bats. This would assist in maintaining the desired temperature and humidity in the cave or mine. This would also reduce visibility of the cave or mine and lessen the risk of the feature being disturbed by humans.

Implementation of a 0.5 mile buffer around raptor nests from noise and disturbance during the breeding season would prevent raptors from abandoning the nest during the critical breeding and brood rearing seasons. Reduction in disturbance and stress to birds during this critical period would increase the potential for recruitment and would benefit the population within the Decision Area over the long-term. Alternative B would provide more protection from noise disturbance than Alternatives A or D, but less than Alternative C.

Protection of unoccupied raptor nests for five years and the retention of suitable forest habitats within 0.25 mile around unoccupied nests would protect nesting sites for raptors. Alternative B would provide more protection of these important areas than Alternatives A and D but less than Alternative C.

Alternatives B and C would actively restore vegetation around or near bald eagle nest trees (after the breeding season) to protect nest trees from fire and to promote development of nesting and perching habitat.

The effects related to mineral development, including oil and gas would be the same as described under "Effects Common to All Alternatives" and "Effects of Alternative B" in the general Wildlife section.

All alternatives would have 12 stipulations to lessen the effects of oil and gas development on special status species (stipulations that affect wildlife are described in the general Wildlife section) (**Table 4-12**).

Under Alternative B, these stipulations would include: NSO around bald eagle nests, peregrine falcon nests, ferruginous hawk nests, prairie dog towns and sage grouse leks and timing restrictions in grizzly bear habitat, sage grouse winter, spring and breeding habitat, other raptor breeding habitat and bald eagle breeding habitat.

The five areas with the most potential for oil and gas development in the Decision Area are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. There is currently one known bald eagle nest in the southern Deerlodge Valley area but is outside of federal mineral estate lands. There are no known ferruginous hawk, peregrine falcon, or other raptor breeding territories in this area. There is no known sage grouse habitat or prairie dog towns in this area. This area is not within the distribution or recovery zone of grizzly bear and there are no known gray wolf den sites.

Currently, there are eight known bald eagle nest sites in the Sleeping Giant area and approximately 740 acres would be protected with a NSO stipulation (0.5 mile within nest sites). An additional 1,750 acres beyond the 0.5 mile NSO buffers around bald eagle nest sites would have a 2/1–8/31 timing restriction (same as Alternatives A and D). There are no known ferruginous hawk breeding territories, sage grouse habitat, or prairie dog towns in this area. There is one known peregrine falcon nest site outside of surface and subsurface ownership. Approximately 30 acres would be protected with a NSO (1 mile within nest site). Other raptor breeding territories in the Sleeping Giant area would be protected with approximately 1,330 acres with a timing restriction of 3/1-7/31. This would be less protective than Alternatives A, C and D which prohibit habitat loss and disturbance around the nest site. Approximately 2,600 acres are within occupied grizzly bear habitat and would be protected with spring (4/1-6/30) and fall (9/15-10/15) timing restrictions. This would ensure grizzly bears would be free from disturbance due to oil and gas exploration during important times in their life cycle. There are no known gray wolf den or rendezvous sites in this area.

Currently, there are six known bald eagle nests sites in the Canyon Ferry area and approximately 330 acres would be protected with the 0.5 mile NSO stipulation. An additional 1,100 acres beyond the 0.5 acre NSO buffer around bald eagle nests would have a 2/1–8/31 timing restriction (same as Alternatives A and D). There are no known ferruginous hawk nests, peregrine falcon breeding territories, sage grouse habitat, or prairie dog towns in this area. Other raptor breeding territories in the Canyon Ferry area would be protected with approximately 500 acres in a timing restriction of 3/1-7/31. The area is not within the recovery zone or occupied grizzly bear habitat and there are currently no known gray wolf den or rendezvous sites.

In the Bozeman area, there are currently no known bald eagle nest sites, ferruginous hawk breeding territories, peregrine falcon nests sites, sage grouse habitat, or prai-

rie dog towns. Approximately 1,300 acres are within occupied grizzly bear habitat and would be protected with spring (4/1-6/30) and fall (9/15-10/15) timing restrictions. This would ensure grizzly bears are free from disturbance due to oil and gas exploration during important time of their life cycle. There are no known gray wolf den or rendezvous sites in this area.

Currently, there are four known bald eagle nests in the Livingston area and approximately 40 acres would be protected with the NSO stipulation. An additional 300 acres beyond the 0.5 mile NSO buffer would have a 2/1–8/31 timing restriction. There are no known ferruginous hawk nests, other raptor nest sites, sage grouse leks/breeding habitat, or prairie dog towns in this area. There are, however, approximately 43 acres within sage grouse winter and spring habitat that would be protected with a 12/1-5/15 timing restriction (same as Alternatives A and D). There is one known peregrine falcon breeding territory in the Livingston area that would be protected with approximately 60 acres in a NSO stipulation. Approximately 100 acres within occupied grizzly bear habitat would be protected with spring (4/1-6/30) and fall (9/15-10/15) timing restrictions. There are no known gray wolf den or rendezvous sites in this area.

Across the Decision Area, there would be 2,600 acres surrounding bald eagle nest sites that would be protected with a NSO stipulation under Alternatives A, B and D (**Table 4-12**). Three of the five areas with the most potential for oil and gas development have bald eagle nest sites (1,110 acres) that would be protected with the NSO stipulation. An additional 3,150 acres would be protected beyond the bald eagle nest NSO boundary with a timing restriction of 2/1-8/31 (**Table 4-12**). This would be the same amount of protection provided under Alternatives A and D but less protection than under Alternative C (NL 1 mile adjacent to nests).

Across the Decision Area including within the five areas with the most potential for oil and gas development, there would be 0 acres protected with a NSO stipulation for ferruginous hawks because there are no known breeding territories (**Table 4-12**). When located, ferruginous hawk breeding territories would be given more protection under Alternative B compared to Alternatives A and D but less than Alternative C.

Across the Decision Area, there would be 3,820 acres surrounding peregrine falcon nest sites protected with a 1 mile NSO stipulation. Two of the five areas with the most potential for oil and gas development currently have known nest sites (Sleeping Giant and Livingston) within federal mineral estate lands. A total of 90 acres would be protected with a 1 mile NSO surrounding peregrine falcon nest sites (**Table 4-12**).

Alternative B would provide substantially more protection to peregrine falcons by reducing disturbance and preventing loss of habitat than Alternative A. The other action alternatives would provide the same amount of protection as Alternative B.

Across the Decision Area, there would be 7,400 acres of other known raptor breeding territories (such as golden eagles) protected with a 0.5 mile timing restriction. Only two of the five areas with the most potential for oil and gas development (Sleeping Giant and Canyon Ferry) currently have other known raptor breeding territories that would be protected with the timing restriction of 3/1-7/31 (1,830 acres). Unlike Alternatives A, C and D, this alternative would not protect habitat from alteration. Alternative B would protect more area from disturbance than Alternatives A and D, but would protect the same area as Alternative C.

Currently, there are no known active prairie dog towns within the Decision Area (including the five areas with the most potential). When located, all alternatives would protect the actual prairie dog town with a NSO but only Alternative A would protect habitat around prairie dog towns for expansion of the town. Alternative A would provide more protection to prairie dogs than all other alternatives.

Within the Decision Area and the five areas with the most potential for oil and gas development there are no known sage grouse lek sites. However, across the Decision Area there would be approximately 2,800 acres of sage grouse breeding habitat located within 3 miles of lek sites protected with a timing restriction of 3/1-6/30. In the five areas with the most potential for oil and gas development there is currently no known sage grouse breeding habitat. This alternative would provide the same amount of protection as under Alternative D, less protection than Alternative C but more than Alternative A. Decision Area-wide there are approximately 67,000 acres within sage grouse winter and spring range that would be protected with a 12/1-5/15 timing restriction (same as Alternatives A and D). One of the five areas with the most potential for oil and gas development has a small amount of known sage grouse winter or spring range (43 acres) that would be protected with the timing restriction.

Currently in the Decision Area, there is only one known gray wolf den site. Approximately 700 acres would be protected around this den site with a timing restriction of 4/15-6/30 (1 mile from den or rendezvous site). Unlike Alternatives A and D, this alternative would ensure that the den and rendezvous sites are not disturbed from oil and gas exploration.

Decision Area-wide, there are approximately 7,400 acres in grizzly bear recovery areas that would be protected with a NSO stipulation. None of the five areas with high potential for oil and gas development are within the recovery zone of the grizzly bear. Approximately, 54,000 acres within occupied grizzly bear would be protected with spring (4/1-6/30) and fall (9/15-10/15) timing restrictions. Three of the five areas with the most

potential for oil and gas development are within the distribution of grizzly bear (Sleeping Giant and Livingston) and approximately 4,000 acres would have the spring and fall timing restrictions under Alternative B. Unlike Alternatives A and D, Alternative B would ensure that grizzly bears are free from disturbance associated with oil and gas exploration during crucial times of the year.

Fish

The effects described under "Effects Common to All Alternatives" and "Effects of Alternative B" in the general Fish section would be the same for special status fish species.

Riparian Management Zones (RMZs) would be established for this alternative that would be wider than SMZs of Alternatives A and D but narrower than RMZs of Alternative C. Effects would the same as described under "Effects of Alternative B" in the general Fish section.

Riparian Management Zones under Alternative B would offer more protection to special status species than Alternatives A or D but less than half the protection offered under Alternative C (**Table 4-9** and **Table 4-10**). Effects would be the same as described under "Effects of Alternative B" in the general Fish section.

Restoration activities could have minor to moderate and short-term affects from a pulse of fine sediment and runoff to streams due to a reduction in riparian vegetation. However, the long-term benefits to aquatic and riparian resources from an increase in diversity and vigor of riparian vegetation would outweigh the short-term impacts.

Under Alternative B, there would be an emphasis on maintaining and restoring habitat for genetically pure and slightly hybridized (<20 percent) populations of westslope cutthroat trout. Alternative B would focus protection on more populations of westslope cutthroat trout than Alternatives A and D, but fewer than Alternative C.

Alternatives B and C would emphasize the removal (through various means) of non-native aquatic species that out-compete or breed with westslope cutthroat trout. This would increase the quantity of available habitat for native species and reduce hybridization between rainbow trout and westslope cutthroat trout.

Alternatives B and C would contain the greatest amount of habitat protected for special status fish species (5 miles) due to the designation of ACECs.

All alternatives would have five stipulations to lessen the effects of oil and gas development on special status fish (other stipulations that affect fish are described in the general Fish section) (**Table 4-13**). Under Alternative B, these stipulations would include NSO adjacent to Arctic grayling, bull trout and westslope and Yellowstone cutthroat trout streams.

The five areas with the most potential for oil and gas development in the Decision Area are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. In the southern Deerlodge Valley area, there is no habitat for Yellowstone cutthroat trout and Arctic grayling and no known habitat for 90-100 percent genetically pure westslope cutthroat trout. Lost Creek, a bull trout stream, flows outside of the southern Deerlodge Valley area but when a 0.5 mile NSO buffer is applied, approximately 32 acres adjacent to this stream on federal mineral estate lands would be protected from loss of habitat.

In the Sleeping Giant area, there is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout and there is no known habitat for 90-99 percent genetically pure westslope cutthroat trout. However, there are approximately 700 acres adjacent to streams with 99-100 percent genetically pure westslope cutthroat trout that would be protected with a 0.5 mile NSO stipulation on either side of the stream. This would provide greater protection to riparian habitat, aquatic habitat, water quality, and surface/subsurface flows than Alternative A.

In the Canyon Ferry area, there is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout and there is no known habitat for 90-100 percent genetically pure westslope cutthroat trout.

In the Bozeman area, there is no habitat for Arctic grayling, bull trout, or habitat for 90-100 percent genetically pure westslope cutthroat trout. There would be approximately 30 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a 0.5 mile NSO stipulation on either side of streams. Alternative B would protect more acres from loss of riparian habitat and upslope habitat that could affect riparian and aquatic functions for this species than Alternatives A and D.

In the Livingston area, there is no habitat for Arctic grayling, bull trout, or 90-100 percent genetically pure westslope cutthroat trout. There would be approximately 930 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a 0.5 mile NSO stipulation. Alternative B would protect more acres from loss of riparian habitat and upslope habitat that could affect riparian and aquatic functions than Alternatives A and D.

Decision Area-wide, there would be 27,400 acres adjacent to streams with Arctic grayling that would be protected with a NSO stipulation under Alternative B (0.5 mile from either side of streams). Alternatives B and C would protect substantially more acres adjacent to Arctic grayling streams from development due to oil and gas than Alternative A. None of the five areas with the most potential for oil and gas development have habitat for Arctic grayling (**Table 4-13**).

Decision Area-wide, there would be 2,200 acres adjacent to streams with 90-99 percent genetically pure westslope cutthroat trout that would have a NSO stipulation under Alternative B (0.5 mile from either side of stream). None of the five areas with the most potential for oil and gas development have known habitat for 90-99 percent genetically pure westslope cutthroat trout (**Table 4-13**).

Decision Area-wide, there would be 11,000 acres adjacent to streams with 99-100 percent genetically pure westslope cutthroat trout that would have a NSO stipulation under Alternative B (0.5 mile from either side of stream). One of the five areas with the most potential for oil and gas development (Sleeping Giant) has habitat for 99-100 percent genetically pure westslope cutthroat trout and approximately 700 acres adjacent to these streams would be protected with a NSO (**Table 4-13**). Alternatives B, C and D would protect substantially more acres adjacent to westslope cutthroat trout (99-100 percent pure) streams from development due to oil and gas than Alternative A.

In the Decision Area, there would be 7,100 acres adjacent to streams with Yellowstone cutthroat trout that would have a NSO stipulation under Alternative B (0.5 mile from either side of stream). Two of the five areas with the most potential for oil and gas development (Bozeman and Livingston) have habitat for Yellowstone cutthroat trout and approximately 930 acres adjacent to these streams would be protected with a NSO (**Table 4-13**). Alternatives B and C would protect substantially more acres adjacent to Yellowstone trout streams from development due to oil and gas than the Alternative A.

In the entire Decision Area, there would be 4,000 acres adjacent to streams with bull trout that would have a NSO stipulation under Alternative B (0.5 mile from either side of stream). One of the five areas with the most potential for oil and gas development (southern Deerlodge Valley) has habitat for bull trout and approximately 32 acres adjacent to these streams would be protected with a NSO (**Table 4-13**). Unlike Alternative A, Alternatives B, C, and D would ensure that bull trout habitat would not be lost due to oil and gas exploration and development.

Under Alternatives B, D and A, westslope cutthroat trout would not be protected in the Muskrat and Nursery Creek drainages with a 180-acre mineral withdrawal of the streams and riparian areas. Muskrat Creek has importance to westslope cutthroat trout restoration beyond the local level because after a ten year, $50,000 restoration effort, its population is now used as a donor source to re-establish westslope cutthroat trout populations in a number of different locations in the state of Montana. Without the protection of a mineral withdrawal, this genetically pure population of westslope cutthroat trout could be impacted or lost due to a loss of riparian vegetation, streambed and bank destabilization, erosion and sedimentation, loss of floodplain vegetation, alteration of floodplain morphology, and alteration of stream channel morphology that could occur in association with locatable minerals, particularly placer mining. Another significant key impact placer mining would have on westslope cutthroat trout is excavation, crushing, or disturbance of streambed gravels during the critical period of 6/1-8/31 when cutthroat trout are spawning and eggs are incubating/hatching in redds in the streambed. If extensive mining impacts occurred in Muskrat Creek, it may not be possible to reclaim the stream adequately to re-establish the current population level of westslope cutthroat trout.

MFWP, BLM, USFS, and other entities are currently making efforts to restore westslope cutthroat trout (a sensitive species) populations in a portion of their historic, but currently unoccupied habitat in the Upper Missouri River basin. One goal of these efforts is to prevent a federal listing of this species under the Endangered Species Act. The Muskrat Creek westslope cutthroat trout population is used by MFWP as a donor source of fish to re-establish populations in other streams within and beyond the Planning Area boundaries. In this sense, the Muskrat Creek population is disproportionately important to westslope cutthroat trout restoration throughout the Upper Missouri River basin. If mining operations cause a decline in this population, the population may no longer be able to function as a donor source and efforts to restore other populations and prevent a federal listing of this species may be impeded.

Plants

Assuming that the low end of the range of proposed weed treatments is implemented under any alternative, under Alternative B, 48,000 acres of noxious weed spread is projected. This would be more weed spread than under Alternatives A or D, therefore the threat of special status plant habitat loss caused by noxious weed spread could be more for this alternative than Alternatives A or D. The reduced disturbances afforded by RMZs for the forested riparian species Idaho sedge and small yellow lady's slipper would be more than under Alternatives A or D, but less than under Alternative C. Additionally, the buffer on non-forested riparian areas would reduce the threat of habitat disturbance for species such as dwarf purple monkey-flower, mealy primrose or Ute ladies' tresses. Dry forest, shrub and grass treatments (30,200 acres per decade) to maintain or restore habitat of Lemhi penstemon, sapphire rockcress and lesser rushy milkvetch would be higher than under all alternatives except Alternative D.

Oil and gas leasing NSO restrictions within 0.25 mile of known populations would protect them by decreasing the potential for disturbance. Fewer acres of the field office would be available for locatable mineral entry, causing this alternative along with Alternative C to have the least possibility of habitat disturbance.

Effects of Alternative C

Wildlife

The effects from Alternative C to special status wildlife species would be the same as described under "Effects of Alternative C" in the general Wildlife section.

Alternative C would emphasize "passive" restoration and would treat the least amount of dry forest habitat for migratory birds, northern goshawks, flammulated owls, long-legged myotis, long-eared myotis, and fringed myotis compared to Alternatives A, B and D. The short-term impacts from disturbance would be much less than with the other alternatives but the long-term benefits of restoring habitat for dry forest species would be substantially less than under Alternatives B and D.

The effects on special status wildlife species from treatments under Alternative C in cool, moist forest habitat would be the same as described under "Effects of Alternative C" in the general Wildlife section. Alternative C would restore the fewest acres of cool, moist forest habitat for migratory birds, lynx, fisher, wolverine, and bat species compared to the other alternatives.

Determining the range of natural conditions for snag habitat would be the same as Alternative B. However, the creation of snags would only be done opportunistically through other projects. Snags would be protected but not necessarily created in snag deficient areas like under Alternative B. Due to lack of vegetation treatments and active snag management, Alternative C could create less snag habitat in snag deficient areas over the long-term than Alternative B but would be similar to Alternatives A and D.

Whereas Alternative B would not entail identifying the acres of dead and dying forest that would be retained during timber salvage, Alternative C would require 50 percent of dead and dying forest be retained in stands that exceed 1,000 acres (unless human safety is an issue). Although all action alternatives would provide some protection to dead and dying forests, Alternative C would guarantee the retention of moderate to large-sized blocks of dead and dying forests for special status species. Connectivity and diversity of habitats as well as species productivity would be greatest for those species dependent on snag habitat, such as three-toed and black-backed woodpeckers, under Alternative C than under any other alternative.

The effects on special status wildlife species from treatments under Alternative C in grasslands and shrublands would be the same as described under "Effects of Alternative C" in the general Wildlife section. Alternative C would restore the fewest acres of grassland and sagebrush shrubland of all the alternatives, especially Alternatives B and D, for migratory birds, golden eagles, ferruginous hawks, Swainson's hawks, long-billed curlews, Brewer's sparrows, mountain plovers, sage grouse, and pygmy rabbit. Alternative C would restore substantially fewer acres compared to Alternatives B and D and slightly less grassland than Alternative A. Alternative C would restore more acres of sagebrush than Alternative A.

Noxious weed management would have minimal negative impacts on special status species but could provide substantial beneficial effects. The effects on special status wildlife species from noxious weeds under Alternative C would be the same as described under "Effects of Alternative C" in the general Wildlife section.

Alternative C would reduce the risk of mortality to special status nesting birds, including migratory and resident birds, during prescribed fire and mechanical treatments. Alternative C would exclude project implementation during the breeding season in areas that have substantial use by breeding birds. This would prevent the most mortality to migratory and resident birds during the breeding season of all alternatives.

Under Alternative C, Riparian Management Zones would be established that would be wider than under all other alternatives. A 300-foot RMZ for fish bearing streams and a 150-foot zone for non-fish bearing streams would be implemented under Alternative C. As with the other alternatives, the RMZs could have management activities. Unlike Alternatives A and D, Alternative C and B would only allow management within riparian areas that protect, enhance or restore the riparian goals and objectives. Unlike Alternative B, trees could not be removed from the RMZ during restoration unless they would be used for other restoration activities (i.e. in-stream restoration or erosion control) under this alternative.

Alternative C would establish the most acres of all alternatives where the emphasis would be to restore, protect, or enhance riparian habitats for aquatic and terrestrial species that use riparian zones for all or part of their lifecycle. Alternative C would provide the best protection to all special status species that use riparian areas of all alternatives. This alternative would also ensure that critical movement corridors are maintained for numerous special status species.

There would be substantially fewer miles of open roads under Alternative C compared to Alternative A. Alternative C would also have fewer open roads than Alternatives B and D. The effects of roads on special status species would be the same as described under "Effects Common to All" and "Effects of Alternative C" in the general Wildlife section.

Alternative C would prevent the greatest loss of habitat or disturbance to bears in occupied grizzly bear habitat of all alternatives by allowing no net increase in permanent roads where open road densities are 1.5 mi/mi^2 or less. The BLM would also emphasize closing roads in occupied grizzly bear habitat where open road densities exceed 0.5 mi/mi^2. Alternative C would provide the most acres of suitable habitat for grizzly bears and re-

duce the potential for human-bear interactions more than all other alternatives.

Through travel management, Alternative C would provide the greatest benefit to grizzly bears and other special status species by reducing fragmentation of habitats, protecting larger blocks of habitat and reducing disturbance.

Alternative C would have the fewest acres open for cross-country snowmobile use (26,148 acres). The detrimental affects to special status species due to cross-country snowmobile use would be substantially less under Alternative C than under all other alternatives.

The retention of vegetation around caves and abandoned mines for special status bat species would be the same as under Alternative B.

Implementation of a 1-mile buffer around raptor nests from noise and disturbance during the breeding season would prevent raptors from abandoning the nest during the critical breeding and brood rearing seasons more than under all other alternatives. Reduction in disturbance and stress to birds during this critical period would increase the potential for recruitment and benefit the population within the Decision Area over the long-term. Alternative C would provide more protection from noise disturbance than all other alternatives.

Unoccupied raptor nests would also have greater protection under this alternative than under all other alternatives. Alternative C would require all unoccupied raptor nests that are in good condition to be maintained for 7 years. This alternative would also require that suitable forested habitat within 0.5 mile around the unoccupied nests be maintained.

Restoration of vegetation around bald eagle roost and nest trees would be the same as under Alternative B.

The effects related to mineral development, including oil and gas would be the same as described under "Effects Common to All Alternatives" and "Effects of Alternative C" in the general Wildlife section.

All alternatives would have 12 stipulations to lessen the effects of oil and gas development on special status species (stipulations that affect wildlife are described in the general Wildlife section). Under Alternative C, these stipulations would include No Surface Occupancy (NSO) in sage grouse breeding habitat, grizzly bear habitat; and No Lease (NL) in and around prairie dog towns, sage grouse winter, spring and strutting grounds (leks), bald eagle nests, peregrine falcon nests and ferruginous hawk nests. There would also be a timing restriction around ferruginous hawk nests under this alternative.

The five areas with the most potential for oil and gas development in the Decision Area are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. There is currently one known bald eagle nest site in the southern Deerlodge Valley area but it is well outside of any federal mineral estate lands. There are no known ferruginous hawk nests, peregrine falcon nests or other raptor breeding territories in this area. There is no known sage grouse habitat or prairie dog towns in this area. This area is not within the distribution or recovery zone of grizzly bear and there are no known gray wolf den or rendezvous sites.

Currently, there are eight known bald eagle nests sites in the Sleeping Giant area and approximately 2,530 acres would be protected with a NL stipulation. There are no known ferruginous hawk nests, sage grouse habitat, or prairie dog towns in this area. There is one known peregrine falcon nest site just outside of federal mineral estate lands. After applying the 1 mile buffer to this nest, approximately 30 acres of federal mineral estate lands would be protected with NL. Other raptor breeding territories in the Sleeping Giant area would be protected with approximately 1,330 acres in NL. This would be the most restrictive alternative and would provide the most protection to raptors from disturbance and loss of habitat. Approximately 2,600 acres are within occupied grizzly bear habitat and would be protected with a NSO. This would ensure grizzly bears are free from disturbance due to oil and gas exploration and that there would be no loss of habitat. There are no known gray wolf den or rendezvous sites in this area.

Currently, there are six known bald eagle nests sites in the Canyon Ferry area and approximately 1,500 acres would be protected with NL. There are no known ferruginous hawk nests, peregrine falcon nest, sage grouse habitat, or prairie dog towns in this area. Other raptor breeding territories in the Canyon Ferry area would be protected with approximately 500 acres in NL. The area is not within the recovery zone or the distribution of grizzly bear and there are currently no known gray wolf den or rendezvous sites.

There are currently no known bald eagle nest sites, ferruginous hawk nests, peregrine falcon nests, sage grouse habitat, or prairie dog towns in the Bozeman area. Approximately 1,300 acres are within occupied grizzly bear habitat and would be protected with a NSO stipulation. This would ensure grizzly bears are free from disturbance due to oil and gas exploration and development and that there would be no loss of habitat. There are no known gray wolf den or rendezvous sites in this area.

Currently, there are four known bald eagle nest sites in the Livingston area and approximately 300 acres would be protected with NL. There are no known ferruginous hawk nests, other raptor nest sites, sage grouse leks/breeding habitat, or prairie dog towns in this area. There are however, approximately 43 acres within sage grouse winter and spring habitat that would be protected with NL. There is one known peregrine falcon nest site in the Livingston area that would be protected with approximately 60 acres in a NL area. Approximately 100

acres are within occupied grizzly bear habitat and would be protected with a NSO stipulation. There are no known gray wolf den or rendezvous sites in this area.

Decision Area-wide, there would be 9,450 acres surrounding bald eagle nest sites and breeding habitats that would have a NL stipulation under Alternative C (1 mile from nest). Three of the five areas with the most potential for oil and gas development (Sleeping Giant, Canyon Ferry and Livingston) have bald eagle nest sites (4,330 acres) that would be protected with the 1 mile NL stipulation (**Table 4-12**).

This alternative would protect breeding bald eagles from disturbance or loss of habitat associated with oil and gas exploration and development more than any other alternative.

Decision Area-wide and within the five areas with the most potential for oil and gas development, there would be 0 acres protected for ferruginous hawks (there are no known breeding territories). When located, ferruginous hawk breeding territories would be given more protection under Alternative C compared to all other alternatives.

Across the Decision Area, there would be 3,820 acres surrounding peregrine falcon nest sites with a NSO (1 mile) stipulation. Two of the five areas with the most potential for oil and gas development currently have known nest sites (Sleeping Giant and Livingston) within surface or subsurface ownership and a total of 90 acres would be protected with NL (**Table 4-12**).

Alternatives B, C and D would provide substantially more protection to peregrine falcons by reducing disturbance and preventing loss of habitat than Alternative A. Alternative C would provide additional protection to peregrine falcons over Alternatives B and D by preventing directional drilling under the 3,800 acres surrounding the nest site. Prohibiting directional drilling could prevent negative impacts on water quality and/or quantity in peregrine falcon habitat.

Decision Area-wide, there would be 7,400 acres of other know raptor breeding territories (such as golden eagles) protected with NL (0.5 mile). Only two of the five areas with the most potential for oil and gas development (Sleeping Giant and Canyon Ferry) currently have other known raptor breeding territories that would be protected with the NL stipulation (1,830 acres). Alternative C would provide the most protection from disturbance and habitat loss compared to the other alternatives from oil and gas exploration and development.

Currently, there are no known active prairie dog towns within the Decision Area (including the five areas with the most potential) (**Table 4-12**). When located, all alternatives would protect the actual prairie dog town with a NSO but only Alternative A would protect habitat around prairie dog towns for expansion of the town. Alternative A would provide more protection to prairie dogs than all other alternatives.

Within the Decision Area and the five areas with the most potential for oil and gas development there are no known sage grouse lek sites. However, across the Decision Area there would be approximately 2,800 acres of sage grouse breeding habitat located within 3 miles of lek sites protected with a NSO. In the five areas with the most potential for oil and gas development there is currently no known sage grouse breeding habitat. Across the Decision Area, there are approximately 67,000 acres within sage grouse winter and spring range that would be protected with NL. One of the five areas with the most potential for oil and gas development has a small amount of known sage grouse winter or spring range (43 acres) that would be protected with the NL stipulation (**Table 4-12**).

Overall, this alternative would provide the greatest amount of protection to breeding and overwintering sage grouse compared to all other alternatives. Alternative C would not only prevent disturbance to nesting sage grouse, thereby ensuring successful reproduction, but would also prevent any habitat loss or degradation due to oil and gas development. Prohibiting directional drilling could prevent negative impacts on water quality and/or quantity in sage grouse habitat.

Currently in the Decision Area, there is only one known gray wolf den site. Approximately 700 acres would be protected around this den site with a NSO (1 mile from den or rendezvous site) stipulation. Unlike Alternatives A, B and D, this alternative would ensure that den and rendezvous sites are not disturbed from oil and gas exploration and development. There are no known den or rendezvous sites in the five areas with the most potential for oil and gas development.

In the Decision Area, there are approximately 7,400 acres in grizzly bear recovery areas would be protected with a NSO stipulation. None of the five areas with high potential for oil and gas development are within the grizzly bear recovery zone. Approximately 54,000 acres within occupied grizzly bear habitat would be protected with a NSO stipulation. Three of the five areas with the most potential for oil and gas development are within occupied grizzly bear habitat (Sleeping Giant and Livingston) and approximately 4,000 acres would have the NSO stipulation. Unlike Alternatives A, B and D, Alternative C would ensure that grizzly bears are not only free from disturbance but also from loss of habitat due to oil and gas exploration and development.

All stipulations under Alternative C would be either NSO or NL for special status species. In addition, the buffer around bald eagle nest sites and sage grouse breeding habitat would be larger than the other alternatives. Under Alternative C, essential habitat for special status species would not be altered or lost due to oil and gas exploration or development. Alternative C would

protect more habitat for these species compared to all other alternatives. For those special species with a NL stipulation (bald eagle, peregrine falcon and other raptors, and sage grouse), additional protection is given by preventing directional (subsurface) drilling that could degrade water quality or reduce water in streams, rivers and wetlands within crucial habitat for these species.

Fish

The effects described under "Effects Common to All Alternatives" and "Effects of Alternative C" in the general Fish section would be the same for special status fish species.

Like Alternative B, Alternative C would also establish additional protection to streams through Riparian Management Zones (RMZs). However, these RMZs would be wider under Alternative C than Alternative B. Riparian Management Zones under Alternative C would provide the most acreage adjacent to streams where emphasis would be placed on maintenance, restoration, and/or protection of riparian and stream functions of all alternatives.

This alternative would provide exceptional and nearly complete protection for special status fish and other aquatic organisms by only allowing activities in riparian areas that would restore or maintain riparian and stream habitats and functions. The width of these RMZs would ensure that the introduction of fine sediment would be negligible and the delivery of large woody material and organic matter would be maximized. Effects would be the same as described under "Effects of Alternative C" in the general Fish section.

Unlike the other alternatives, Alternative C would emphasize maintaining or restoring habitat for all populations of westslope cutthroat trout, regardless of hybridization. As with Alternative B, Alternative C would emphasize removing brook trout and other non-native species that out-compete or breed with westslope cutthroat trout.

Alternatives B and C would contain the greatest amount of habitat protected for special status fish species (5 miles) due to the designation of ACECs.

All alternatives would have five stipulations to lessen the effects of oil and gas development on special status fish (other stipulations that affect fish are described in the general Fish section) (**Table 4-13**). Under Alternative C, these stipulations would include NSO adjacent to Arctic grayling and westslope cutthroat trout (90-99 percent genetically pure); and NL for bull trout streams, westslope cutthroat trout (99-100 percent genetically pure) and Yellowstone cutthroat trout.

The five areas with the most potential for oil and gas development in the Decision Area are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. In the southern Deerlodge Valley area, there is no habitat for Yellowstone cutthroat trout and Arctic grayling and no known habitat for 90-100 percent genetically pure westslope cutthroat trout. Lost Creek, a bull trout stream, flows outside of the southern Deerlodge Valley area but when a 1-mile NL buffer is applied, approximately 420 acres of federal mineral estate lands adjacent to this stream would be protected from loss of habitat, water quality or water quantity.

In the Sleeping Giant area, there is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout and there is no known habitat for 90-99 percent genetically pure westslope cutthroat trout. However, there are approximately 700 acres adjacent to 99-100 percent genetically pure westslope cutthroat trout streams in this area that would be protected with a 0.5 mile NL on either side of streams. This would provide greater protection to riparian habitat, aquatic habitat, water quality and surface/subsurface flows than Alternatives A, B or D.

In the Canyon Ferry area, there is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout and there is no known habitat for 90-100 percent genetically pure westslope cutthroat trout.

In the Bozeman area, there is no habitat for Arctic grayling, bull trout, or habitat for 90-100 percent genetically pure westslope cutthroat trout. There would be approximately 30 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a 0.5 mile NL. This would provide greater protection to riparian habitat, aquatic habitat, water quality and surface/subsurface flows than Alternatives A, B or D.

In the Livingston area, there is no habitat for Arctic grayling, bull trout, or habitat for 90-100 percent genetically pure westslope cutthroat trout. There would be approximately 900 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a 0.5 mile NL.

Decision Area-wide, there would be 27,400 acres adjacent to streams with Arctic grayling that would have a NSO stipulation under Alternative C (0.5 mile from either side of stream) (**Table 4-13**). This would be the same as Alternative B and more protective than Alternatives A and D. None of the five areas with the most potential for oil and gas development have habitat for Arctic grayling.

Across the Decision Area, there would be 2,200 acres adjacent to streams with 90-99 percent genetically pure westslope cutthroat trout that would have a NSO stipulation under Alternative C (0.5 mile from either side of stream). None of the five areas with the most potential for oil and gas development have habitat for 90-99 percent genetically pure westslope cutthroat trout. Alternatives C and B would provide the same amount of protection to 90-99 percent genetically pure westslope cutthroat trout populations, but more protection than Alternatives A and D.

Decision Area-wide, there would be 11,000 acres adjacent to streams with 99-100 percent genetically pure westslope cutthroat trout that would have a NL stipulation under Alternative C (0.5 mile from either side of stream). Alternatives B, C and D would protect substantially more acres adjacent to westslope cutthroat trout (99-100 percent pure) streams from development due to oil and gas than Alternative A. Alternative C would provide additional protection to westslope cutthroat trout over Alternatives B and D by preventing directional drilling beneath 11,000 acres adjacent to streams. Prohibiting directional drilling could prevent negative impacts on water quality and/or quantity in cutthroat trout habitat. One of the five areas with the most potential for oil and gas development (Sleeping Giant) has habitat for 99-100 percent genetically pure westslope cutthroat trout and approximately 700 acres adjacent to these streams would be protected with a NL (**Table 4-13**).

Across the Decision Area, there would be 7,000 acres adjacent to streams with Yellowstone cutthroat trout that would have a NL stipulation under Alternative C. Alternative C would protect substantially more acres adjacent to bull trout streams from development due to oil and gas than all other alternatives. Alternative C would provide additional protection to bull trout by preventing directional drilling beneath 9,200 acres adjacent to streams. Prohibiting directional drilling could prevent negative impacts on water quality and/or quantity in bull trout habitat. Two of the five areas with the most potential for oil and gas development (Bozeman and Livingston) have habitat for Yellowstone cutthroat trout and approximately 930 acres adjacent to these streams would be protected with NL (**Table 4-13**).

Decision Area-wide, there would be 9,200 acres adjacent to streams with bull trout that would have a NL stipulation under Alternative C (1 mile from either side of stream). One of the five areas with the most potential for oil and gas development (southern Deerlodge Valley) has habitat for bull trout and approximately 420 acres adjacent to these streams would be protected with a NL (**Table 4-13**). Alternative C would protect substantially more acres adjacent to bull trout streams from development due to oil and gas than all other alternatives. Alternative C would provide additional protection to bull trout by preventing directional drilling beneath 9,200 acres adjacent to streams. Prohibiting directional drilling could prevent negative impacts on water quality and/or quantity in bull trout habitat.

Unlike all other alternatives, genetically pure westslope cutthroat would be protected from mineral activity in the Muskrat Creek drainage under Alternative C with a 180-acre mineral withdrawal. This would ensure the long-term viability of the new restored population of westslope cutthroat trout in Muskrat Creek. Muskrat Creek has importance to westslope cutthroat trout restoration beyond the local level because after a ten year, $50,000 restoration effort, its population is now used as a donor source to re-establish westslope cutthroat trout populations in a number of different locations in the state of Montana. This withdrawal would benefit the genetically pure westslope cutthroat trout population in Muskrat Creek by preventing loss of riparian vegetation, streambed and bank destabilization, erosion and sedimentation, loss of floodplain vegetation, alteration of floodplain morphology, and alteration of stream channel morphology that could occur in association with locatable minerals activities, particularly placer mining. Another key impact that placer mining could have on westslope cutthroat trout is excavation, crushing, or disturbance of streambed gravels during the critical period of 6/1-8/31 when westslope cutthroat trout are spawning and eggs are incubating/hatching in redds in the streambed.

Plants

Assuming that the low end of the range of proposed weed treatments is implemented under any alternative, under Alternative C the highest rate of noxious weed spread is projected, therefore the threat of special status plant habitat loss could be greatest for this alternative. The protections afforded by RMZs for special status species dependent on riparian areas would be highest under this alternative. Dry forest, shrub, and grass treatments (7,550 acres per decade) to maintain or restore habitat of Lemhi penstemon, sapphire rockcress and lesser rushy milkvetch would be the least under this alternative: on the other hand the possibility of disturbing unknown populations would be reduced. Treatments of cool, moist forest types would be least under this alternative, which would cause the least amount of road construction thus reducing threats to species such as muskroot and Sitka columbine.

Oil and gas leasing NSO restrictions within 0.5 mile of known populations would provide the greatest amount of protection to them with the largest disturbance-free buffer.

Effects of Alternative D

Wildlife

The effects from Alternative D to special status wildlife species would be the same as described under "Effects of Alternative D" in the general Wildlife section.

Dry forests are currently well outside the historic average of natural variability due to fire suppression and heavy historic grazing. The effects on special status wildlife species from treatments under Alternative D in dry forest would be the same as described under "Effects of Alternative D" in the general Wildlife section. Alternative D would restore the most acres of dry forest habitats for migratory birds, northern goshawks, flammulated owls, long-legged myotis, long-eared myotis, and fringed myotis compared to the other alternatives. The short-term impacts from disturbance would be greatest with this alternative but Alternative D would also pro-

vide the most long-term benefits of restoring habitat for dry forest species.

The effects on special status wildlife species from treatments under Alternative D in cool, moist forest habitats would be the same as described under "Effects of Alternative D" in the general Wildlife section. Alternative D would restore the most acres of cool, moist forest habitat for migratory birds, lynx, fisher, wolverine and bat species compared to all other Alternatives.

Like Alternative A, Alternative D would not have retention guidelines for snag and down woody habitat. Snag creation could occur in conjunction with vegetation management projects but snags would not be actively recruited in snag deficient areas.

Unlike Alternative A, snags that have been naturally created being through forest insects, disease, and fire would be retained, to some degree, under Alternative D. This would provide habitat for snag dependant species while still allowing some commodity forest product removal. Alternative D would retain substantially smaller patches of dead and dying forest than Alternatives B and C. Populations of special status species that depend on dead and dying forest would be at greater risk from the loss of nesting and foraging habitat with the implementation of Alternatives A and D than with Alternatives B and C.

Under Alternative D, the effects on special status wildlife species from treatments in grasslands and shrublands would be the same as described under "Effects of Alternative D" in the general Wildlife section. Alternative D would restore more acres of grassland and sagebrush shrubland habitat for migratory birds, golden eagles, ferruginous hawks, Swainson's hawks, long-billed curlews, Brewer's sparrows, mountain plovers, sage grouse, and pygmy rabbit compared to all other alternatives. The short-term effects from disturbance would be greatest under Alternative D.

Noxious weed management would have minimal negative impacts on special status species but could provide substantial beneficial effects. The effects on special status wildlife species from noxious weeds treatments under Alternative D would be the same as described under "Effects of Alternative D" in the general Wildlife section.

Fifty-foot SMZs would be implemented under Alternative D, the same as Alternative A. The effects from SMZs would be the same as described under "Effects Common to All Alternatives" and "Effects of Alternative D" in the general Wildlife section. Smaller riparian management areas proposed under Alternatives D and A, along with the types and extent to management activities allowed in SMZs, would reduce breeding, brood rearing, foraging, hiding cover and movement corridors for a wide range of special status species compared to Alternatives B and C.

Alternative D would actively restore the most acres of forest, riparian, grassland and shrubland habitats for special status species of all alternatives. The trade-off to habitat restoration would be an increase in short-term disturbance and the creation of new and temporary roads to access the Decision Area for vegetative treatments. An increase in temporary and, especially, permanent roads could cause detrimental effects to special status species but the effects would be less than under Alternative A.

Since Alternatives D and A would not have timing restrictions on prescribed burning (Alternatives B and C) or on mechanical treatments (Alternative C), these alternatives would have more mortality of migratory and resident birds during the breeding season through project implementation.

There would be fewer miles of open roads under Alternative D compared to Alternative A. Alternative D, however, would have more open roads than Alternatives B and C. The effects of roads on special status species would be the same as described under "Effects Common to All" and "Effects of Alternative D" in the general Wildlife section. Open road densities under Alternative D could result in fewer acres of year-round habitat and migration corridors, and more disturbance and displacement of wildlife, road kill, and fragmentation of habitat compared to Alternatives B and C.

Alternative D would provide less suitable habitat due to new road construction in occupied grizzly bear habitat than Alternatives B and C by allowing new permanent roads in areas where open road densities are greater than 0.5 mi/mi^2. Grizzly bears under utilize habitat adjacent to roads and the addition of permanent roads in grizzly bear habitat could result in bears avoiding areas. Under this alternative, the BLM would emphasize reducing open road densities in areas where they exceed 1.5 mi/mi^2. This would provide lower quality and less suitable grizzly bear habitat compared to Alternatives B and C but it would provide more habitat than Alternative A.

Alternative D would provide more acres of suitable habitat for grizzly bears and reduce the potential for human-bear interactions than Alternative A, but less than Alternatives B and C.

Through travel management, Alternative D would provide greater benefits to grizzly bears and other special status species by reducing fragmentation of habitats, protecting larger blocks of habitat, and reducing disturbance than Alternative A, but fewer benefits than Alternatives B and C.

Under Alternative D, there would be more acres open for cross-country snowmobile use (139,138 acres) than under Alternatives B and C but less than under Alternative A (no restricted areas). The negative affects due to cross-country snowmobile use to special status species would greater under Alternative D than under Alternatives B and C but less than under Alternative A.

Like Alternative A, this alternative would not restrict clearing vegetation near special status bat habitat (caves and abandoned mines) and could lead to disturbance and detrimental alteration of these habitats.

Protection of breeding raptors from noise and other disturbances would be less restrictive with Alternative D than the other action alternatives with the implementation of a 0.25 mile buffer around active nests. Alternative D would provide greater protection from disturbance than Alternative A but would protect breeding raptors less than Alternatives B and C.

The protection of unoccupied raptor nests for 3 years and retention of suitable forested habitat within a 0.25 mile buffer around unoccupied nests would protect less habitat for raptors than under the other action alternatives but more than under Alternative A.

Like Alternative A, this alternative would not emphasize restoration of vegetation around bald eagle nest sites. This could have greater negative impacts than under Alternatives B and C.

The effects related to mineral development, including oil and gas would be the same as described under "Effects Common to All Alternatives" and "Effects of Alternative D" in the general Wildlife section.

All alternatives would have 12 stipulations to lessen the effects of oil and gas development on special status species (other stipulations that affect wildlife are described in the general Wildlife section) (**Table 4-12**).

Under Alternative D, these stipulations would include CSU for grizzly bear habitat and gray wolf den sites; NSO in and around prairie dog towns, sage grouse leks, bald eagle nest sites, other raptor breeding territories, peregrine falcon nest sites; and timing restrictions for sage grouse winter and spring range, sage grouse breeding habitat, bald eagle breeding habitat and ferruginous hawk nest sites.

The five areas with the most potential for oil and gas development in the Decision Area are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. There is currently one known bald eagle nest site in the southern Deerlodge Valley area but it is well outside of any federal mineral estate lands. There are no known ferruginous hawk nests, peregrine falcon nests or other raptor breeding territories in this area. There is no known sage grouse habitat or prairie dog towns in this area. This area is not within the distribution or recovery zone of the grizzly bear and there are no known gray wolf den or rendezvous sites.

Currently, there are eight known bald eagle nests sites in the Sleeping Giant area and approximately 740 acres would be protected with a NSO stipulation. An additional 1,750 acres beyond the 0.5 mile bald eagle NSO would have a 2/1–8/31 timing restriction (same as Alternatives A and B). There are no known ferruginous hawk nests, sage grouse habitat, or prairie dog towns in this area. There is one known peregrine falcon nest site outside of federal mineral estate lands but after buffering this nest site with a 1 mile buffer, approximately 30 acres would be protected with a NSO stipulation (same as Alternative B). Other raptor breeding territories in the Sleeping Giant area would be given minimal protection under Alternative D with Standard Lease Terms. This would be the same as Alternative A. Like Alternative A, approximately 2,600 acres are within occupied grizzly bear habitat and would have minimal protection with CSU. Under a CSU, there could be exploration and development but with some restrictions. There are no known gray wolf den or rendezvous sites in this area.

Currently, there are six known bald eagle nests sites in the Canyon Ferry area and approximately 330 acres would be protected with a NSO stipulation. An additional 1,100 acres beyond the 0.5 mile bald eagle NSO would have a 2/1–8/31 timing restriction (same as Alternatives A and B). There are no known ferruginous hawk nests, peregrine falcon breeding territories, sage grouse habitat, or prairie dog towns in this area. Other raptor breeding territories in the Canyon Ferry area would be given minimal protection under Alternative D with a Standard Lease Terms. This would be the same as Alternative A. The area is not within the recovery zone or occupied grizzly bear habitat and there are currently no known gray wolf den or rendezvous sites.

There are currently no known bald eagle nest sites, ferruginous hawk nests, peregrine falcon nests, sage grouse habitat, or prairie dog towns in the Bozeman area. Approximately 1,300 acres are within occupied grizzly bear habitat and would be minimally protected with a CSU stipulation. Under a CSU, there could be exploration and development but with some restrictions. There are no known gray wolf den or rendezvous sites in this area.

Currently, there are four known bald eagle nests sites in the Livingston area and approximately 40 acres would be protected with the NSO stipulation. An additional 300 acres beyond the 0.5 mile bald eagle NSO would have a 2/1–8/31 timing restriction. There are no known ferruginous hawk nests, other raptor nest sites, sage grouse leks/breeding habitat, or prairie dog towns in this area. There are, however, approximately 43 acres within sage grouse winter and spring habitat that would be protected with a 12/1-5/15 timing restriction (same as Alternatives A and B). There is one known peregrine falcon breeding territory in the Livingston area that would be protected with approximately 60 acres in a NSO stipulation. Approximately 100 acres are within occupied grizzly bear habitat and would be minimally protected with the CSU stipulation. There are no known gray wolf den or rendezvous sites in this area.

Decision Area-wide, there would be 2,600 acres surrounding bald eagle nest sites that would be protected with a NSO stipulation under Alternatives A, B and D (0.5 mile from nest). Three of the five areas with the

most potential for oil and gas development have bald eagle nest sites (1,110 acres) that would be protected with the 0.5 mile NSO stipulation (**Table 4-12**).

An additional 7,000 acres beyond the NSO boundary would be protected with a timing restriction of 2/1-8/31. This would provide the same protection as Alternatives A and B, but less protection than Alternative C which would have a 1 mile NL stipulation.

Currently in the Decision Area including the five areas with the most potential for oil and gas development, there would be 0 acres protected for ferruginous hawks (there are no known breeding territories). When located, ferruginous hawk breeding territories would be given more protection under Alternative D compared to Alternative A, but less than with Alternatives B and C.

Decision Area-wide, there would be 3,820 acres surrounding peregrine falcon nest sites with the NSO stipulation (1 mile). This would be the same as under Alternative B but more restrictive than under Alternative A. Two of the five areas with the most potential for oil and gas development currently have known nest sites (Sleeping Giant and Livingston) and a total of 90 acres would be protected with a NSO of 1 mile surrounding nest sites. Alternative D would provide more protection to peregrine falcons by reducing disturbance and preventing loss of habitat than Alternative A.

Currently, there are no known active prairie dog towns within the Decision Area (including the five areas with the most potential). When located, all alternatives would protect the actual prairie dog town with a NSO but only Alternative A would protect habitat around prairie dog towns for expansion of the town. Alternative A would provide more protection to prairie dogs than all other alternatives.

Within the Decision Area and the five areas with the most potential for oil and gas development there are no known sage grouse lek sites. However, across the Decision Area there would be approximately 2,800 acres of sage grouse breeding habitat located within 3 miles of lek sites protected with a timing restriction of 3/1-6/30. In the five areas with the most potential for oil and gas development, however, there is currently no known sage grouse breeding habitat. This alternative would provide the same amount of protection as under Alternative B, less protection than Alternative C but more than Alternative A. Decision Area-wide, there are approximately 67,000 acres within sage grouse winter and spring range that would be protected with a 12/1-5/15 timing restriction (same as Alternatives A and B). One of the five areas with the most potential for oil and gas development has a small amount of known sage grouse winter or spring range (43 acres) that would be protected with the timing restriction.

Currently in the Decision Area, there is only one known gray wolf den site. Approximately 700 acres would be minimally protected around this den site with a CSU stipulation (1 mile from den or rendezvous site). Unlike Alternatives B and C, Alternatives A and D would not ensure that den and rendezvous sites are not disturbed from oil and gas exploration because some activity would be allowed near them.

Across the Decision Area, there are approximately 7,400 acres in grizzly bear recovery areas that would be protected with CSU (same as Alternative A). None of the five areas with high potential for oil and gas development are within the recovery zone of the grizzly bear. Approximately 54,000 acres are within occupied grizzly bear habitat and would be minimally protected with a CSU stipulation. Three of the five areas with the most potential for oil and gas development are within occupied grizzly bear habitat (Sleeping Giant and Livingston) and approximately 4,000 acres would have the CSU stipulation. Unlike Alternatives B and C, Alternatives D and A would not fully ensure that grizzly bears are free from disturbance or habitat loss from oil and gas exploration and development.

Fish

The effects described under "Effects Common to All Alternatives" and "Effects of Alternative D" in the general Fish section would be the same for special status fish species.

As with Alternative A, riparian areas would only be protected by SMZs under Alternative D. The SMZ would generally be 50 feet on both sides of the centerline of the stream. This SMZ would provide some protection to special status fish and would have the same effects as described under "Effects Common to All Alternatives" and "Effects of Alternative A" in the general Fish section. Since the width of the SMZs would be smaller than under Alternatives B and C and the management emphasis would not explicitly be to meet riparian goals and objectives, Alternatives A and D could detrimentally affect special status fish by allowing riparian and aquatic habitats to become degraded.

Under Alternative D, there would be an emphasis on maintain and restoring habitat for genetically pure and slightly hybridized (up to 10 percent) populations of westslope cutthroat trout. Alternative D would emphasize less protection and restoration of westslope cutthroat populations compared to Alternatives B and C but more than Alternative A.

Like Alternative A, this alternative would not emphasize the removal of brook trout and other non-native species that out-compete or breed with westslope cutthroat trout. Alternatives A and D would potentially allow more populations of westslope cutthroat trout to be lost from competition or hybridization compared to Alternatives B and C.

Alternative D would contain 2.7 miles of habitat for special status fish species in ACECs. This would be 46 percent less than under Alternatives B and C.

All alternatives would have five stipulations to lessen the effects of oil and gas development on special status fish (stipulations that effect fish are described under "Fish") (**Table 4-13**). Under Alternative D, these stipulations would include: NSO adjacent to 99-100 percent genetically pure westslope cutthroat trout streams and bull trout streams; and CSU adjacent to Arctic grayling and westslope (90-99 percent pure) and Yellowstone cutthroat trout streams.

The five areas with the most potential for oil and gas development in the Decision Area are located near the southern Deerlodge Valley, Sleeping Giant, Canyon Ferry, Bozeman, and Livingston. In the southern Deerlodge Valley area, there is no habitat for Yellowstone cutthroat trout and Arctic grayling and no known habitat for 90-100 percent genetically pure westslope cutthroat trout. Lost Creek, a bull trout stream, flows outside of the southern Deerlodge Valley area but when a 0.5 mile NSO buffer is applied, approximately 32 acres adjacent to this stream in subsurface ownership would be protected from loss of habitat. This would be the same level of protection as under Alternative B, less protection than Alternative C and more than Alternative A.

In the Sleeping Giant area, there is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout and there is no known habitat for 90-99 percent genetically pure westslope cutthroat trout. However, there are approximately 700 acres adjacent to 99-100 percent genetically pure westslope cutthroat trout streams in this area that would be protected with a 0.5 mile NSO on either side of the stream (same as Alternative B). This would provide greater protection from loss of habitat compared to Alternative A.

In the Canyon Ferry area, there is no habitat for Yellowstone cutthroat trout, Arctic grayling, or bull trout and there is no known habitat for 90-100 percent genetically pure westslope cutthroat trout.

In the Bozeman area, there is no habitat for Arctic grayling, bull trout, or habitat for 90-100 percent genetically pure westslope cutthroat trout. There would be approximately 30 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a 0.5 mile CSU on either side of the streams. Alternative D would not ensure complete protection of Yellowstone cutthroat trout streams from loss of riparian habitat. Alternative D could also negatively impact upslope habitat that could affect riparian and aquatic functions to Yellowstone cutthroat streams. This alternative would provide the least amount of protection to Yellowstone cutthroat trout than the other alternatives because exploration and development would be allowed under a CSU stipulation. However, under a CSU stipulation, activity associated with oil and gas development could be relocated, require special design, or require on or off site mitigation measures to prevent impacts to Yellowstone cutthroat trout. This could provide some amount of protection to riparian and aquatic habitats as well as to water quality.

In the Livingston area, there is no habitat for Arctic grayling, bull trout, or habitat for 90-100 percent genetically pure westslope cutthroat trout. There would be approximately 900 acres adjacent to streams with Yellowstone cutthroat trout that would be protected with a 0.5 mile CSU stipulation. Alternative D would not ensure complete protection of Yellowstone cutthroat trout streams from loss of riparian habitat. Alternative D could also negatively impact upslope habitat that could affect riparian and aquatic functions to Yellowstone cutthroat streams. This alternative would provide the least amount of protection to Yellowstone cutthroat trout compared to the other alternatives because exploration and development would be allowed under a CSU stipulation.

Decision Area-wide, there would be 27,400 acres adjacent to streams with Arctic grayling that would have limited protection with a CSU stipulation under Alternative D (0.5 mile from either side of stream). None of the five areas with the most potential for oil and gas development have habitat for Arctic grayling. Habitat for Arctic grayling would have the least amount of protection under Alternative D because some exploration and development would be allowed within 0.5 mile of grayling streams. The effects from a CSU stipulation under Alternative D to fish and other aquatic species could range from minor to major and could have both short-term and long-term effects. Oil and gas operations can disrupt surface and groundwater flow patterns and have the potential to release pollutants to surface and groundwater, contaminating aquatic habitats. Both water and soil contamination may be harmful to riparian and wetland vegetation. Oil and gas development and associated activities could also lead to increased sedimentation and loss of riparian vegetation which could result in a loss of aquatic habitat for the Arctic grayling.

Across the Decision Area, there would be 2,200 acres adjacent to streams with 90-99 percent genetically pure westslope cutthroat trout that would have limited protection with a CSU stipulation under Alternative D (0.5 mile from either side of stream). None of the five areas with the most potential for oil and gas development have habitat for 90-99 percent genetically pure westslope cutthroat trout. Habitat for 90-99 percent genetically pure westslope cutthroat trout would have the least amount of protection under Alternative D because some exploration and development would be allowed within 0.5 mile of cutthroat trout streams. The effects from a CSU stipulation under Alternative D to fish and other aquatic species could range from minor to major and could have both short-term and long-term effects. Oil and gas operations can disrupt surface and groundwater flow patterns and have the potential to release pollutants to surface and groundwater, contaminating aquatic habitats. Oil and gas development and associated activities could also lead to increased sedimentation and loss of riparian vegetation which could result in a loss of aquatic habitat for the westslope cutthroat trout.

Decision Area-wide, there would be 11,000 acres adjacent to streams with 99-100 percent genetically pure westslope cutthroat trout that would have a NSO stipulation under Alternative D (0.5 mile from either side of stream). This would be the same as under Alternative B, less protection than Alternative C, but more protection than Alternative A. One of the five areas with the most potential for oil and gas development (Sleeping Giant) has habitat for 99-100 percent genetically pure westslope cutthroat trout and approximately 700 acres adjacent to these streams would be protected with a NSO stipulation (**Table 4-13**).

Across the Decision Area, there would be 7,100 acres adjacent to streams with Yellowstone cutthroat trout that would have limited protection with a CSU stipulation under Alternative D (0.5 mile from either side of stream). Two of the five areas with the most potential for oil and gas development (Bozeman and Livingston) have habitat for Yellowstone cutthroat trout and approximately 930 acres adjacent to these streams would be protected with the CSU stipulation. Habitat for Yellowstone cutthroat trout would have the least amount of protection under Alternative D because some exploration and development would be allowed within 0.5 mile of cutthroat trout streams.

Across the Decision Area, there would be 4,000 acres adjacent to streams with bull trout that would be protected with a NSO stipulation under Alternative D (0.5 mile from either side of stream). One of the five areas with the most potential for oil and gas development (southern Deerlodge Valley) has habitat for bull trout and approximately 32 acres adjacent to these streams would be protected with the NSO stipulation. Alternative D would provide more protection to bull trout than Alternative A, the same protection as Alternative B, and less protection than Alternative C.

Alternative D would provide the least amount of protection to Arctic grayling, westslope cutthroat trout, and Yellowstone cutthroat trout through the implementation of a CSU stipulation. Under a CSU stipulation, exploration and development could occur adjacent to streams although restrictions could be placed on the type and extent of development. Some protection would be provided under a CSU by restricting exploration and development along streams with special status fish species. Alternative D would have the greatest risks of increased sedimentation to streams, loss of riparian vegetation as well as a greater risk to an alteration of surface and subsurface flows compared to all other alternatives. The effects to bull trout would be the same as under Alternative B.

Under Alternatives A, B and D, westslope cutthroat trout would not be protected in the Muskrat and Nursery Creek drainages by a 180 acre mineral withdrawal in riparian areas. Muskrat Creek has importance to westslope cutthroat trout restoration beyond the local level because after a ten year, $50,000 restoration effort, its population is now used as a donor source to re-establish westslope cutthroat trout populations in a number of different locations throughout Montana. Without the withdrawal, the genetically pure westslope cutthroat trout population in Muskrat Creek could be threatened by the loss of riparian vegetation, streambed and bank destabilization, erosion and sedimentation, loss of floodplain vegetation, alteration of floodplain morphology, and alteration of stream channel morphology that could occur in association with locatable minerals activities, particularly placer mining. Another key impact that placer mining could have on westslope cutthroat trout is excavation, crushing, or disturbance of streambed gravels during the critical period of 6/1 to 8/31 when westslope cutthroat trout are spawning and eggs are incubating/hatching in redds in the streambed. If extensive mining impacts occurred in Muskrat Creek, it would likely not be possible to reclaim the stream adequately to re-establish the current population level of westslope cutthroat trout.

MFWP, BLM, USFS, and other entities are currently making efforts to restore westslope cutthroat trout (a sensitive species) populations in a portion of their historic, but currently unoccupied habitat in the Upper Missouri River basin. One goal of these efforts is to prevent a federal listing of this species under the Endangered Species Act. The Muskrat Creek westslope cutthroat trout population is used by MFWP as a donor source of fish to re-establish populations in other streams within and beyond the Planning Area boundaries. In this sense, the Muskrat Creek population is disproportionately important to westslope cutthroat trout restoration throughout the Upper Missouri River basin. If mining operations cause a decline in this population, the population may no longer be able to function as a donor source and efforts to restore other populations and prevent a federal listing of this species may be impeded.

Plants

Assuming that the low end of the range of proposed weed treatments is implemented under any alternative, under Alternative D the second lowest amount of noxious weed spread is forecast of all alternatives (47,000 acres), therefore the threat of special status plant habitat loss to noxious weed invasion could be less than the other action alternatives. The protections afforded by SMZs for the forested riparian species Idaho sedge and small yellow lady's slipper would be less than the buffers proposed by Alternatives B and C. Dry forest, shrub and grass treatments (44,050 acres per decade) to maintain or restore habitat of Lemhi penstemon, sapphire rockcress and lesser rushy milkvetch would be the highest under this alternative.

Oil and gas leasing NSO restrictions of known plant populations would protect the population but would provide limited protection of habitat with no set disturbance buffer.

WILDLAND FIRE MANAGEMENT

Effects Common to All Alternatives

Proposed management of the following resources, resource uses, and programs would have no or negligible anticipated impacts on fire management: Recreation (except Travel Management), Wilderness Study Areas, Energy and Minerals, Social and Economics, Farmlands, Environmental Justice, and Tribal Treaty Rights.

Treating forests and woodlands to reduce pest and disease risk would generally lead to a reduction in fuels and possibly a change in fire regime condition class (FRCC) by moving condition class toward Class 1 or 2. Reducing fuels would improve suppression effectiveness and firefighter safety. These treatments would be particularly important in the wildland urban interface (WUI). Removing forest products following wildland fire would have the same effect.

Treatments that mimic pre-fire suppression conditions would change FRCC at the stand level, by moving conditions class toward Class 1 or 2 in dry forest types, and consequently reduce fire intensity and improve wildland firefighter safety. All treatments specified (timber harvesting, small-diameter thinning, prescribed burning) would reduce understory fuels and reduce the incidence of stand-replacing fires. Treatments in the WUI would have the same effect, improving wildland fire suppression effectiveness and making it safer for firefighters to suppress wildland fires.

Treatments to reduce stem densities would change FRCC at the stand level, by moving condition class toward Class 1 or 2 and would reduce fuels in the cool moist forest types.

Conifer encroachment would be reduced through treatments, which would move toward changing the condition class in grasslands and shrublands to historic conditions.

Promoting the development of late successional riparian vegetation and reducing conifer encroachment would improve FRCC because conditions would become more like historic conditions in these areas.

Prescribed burning and livestock grazing (including Land Health Standards) would reduce fine fuels, which increase fire spread; and reduce ladder fuels, which facilitate stand replacing fires. Leasing currently unleased allotments or vacant available lands could reduce fine fuels, but could contribute to an increase in FRCC if conifer encroachment also occurs.

Noxious weed treatments would reduce noxious weed infestations, which could change FRCC in areas where cheatgrass or knapweed are contributing to the departure from historic fire regimes.

Reducing the invasion and establishment of undesirable or invasive vegetation species would change FRCC or maintain it at current levels. In some instances, such as with cheatgrass, extreme fire behavior would be reduced, which would reduce fuels and the risk to firefighters.

Fuels management treatments would reduce fuel loadings which would reduce the intensity and severity of wildland and prescribed fires. Reductions in severity of wildland fire would help prevent adverse affects on soil integrity and stability, root systems, and recovery of post-fire vegetation.

Maintaining or moving toward historic fire regimes and Condition Classes would reduce or maintain FRCC. In the dry conifer type, this would improve firefighter safety and reduce the hazard associated with wildland fire risk in the WUI. Prescribed fire, timber harvest and other mechanical methods, used to create a mosaic of successional stages for the benefit of special status species, would change Condition Class and reduce fuels and fire behavior which would improve firefighter safety. Where these treatments occur in the WUI, the risk to the WUI would benefit from the change in FRCC in grassland and dry conifer sites. Treatments in the WUI would be designed to reduce risks and hazards of wildland fire, and would not necessarily be designed to reduce FRCC (particularly in shrubland and cool, moist conifer types), or provide other resource benefits, although changes in FRCC and resource benefits could be a by-product.

Mitigations to protect some species could reduce the extent of treatment or result in methods used that are not as effective in fuel reduction or restoration. For example, even-aged management might be the most effective way to restore FRCC, but the presence of a special status species could require the size of the treatment to be reduced, patches to be left undisturbed or require more cover, which would reduce the effectiveness of the treatment.

Managing areas as Wilderness Areas or Wilderness Study Areas limits activities which would modify FRCC or fuels, however, access would be limited which could reduce the number of human-caused fires, as well as the spread of noxious weeds, which could increase FRCC. Fire suppression would be minimal in these areas.

Mitigating short-term impacts on visual resources could reduce the extent or effectiveness of treatments to reduce FRCC or fuels by limiting areas treated and types of treatment in order to meet visual goals.

Use of prescribed natural fire in ACECs could change FRCC and fuel loadings, as would controlling noxious weeds.

Restrictions applied to wildland fire management actions or wildland fire suppression for air quality protection or to minimize air quality degradation could reduce the effectiveness of treatments or suppression by eliminating some types of treatments (prescribed burning, logging).

For soil resources, mitigation or seasonal restrictions applied to wildland fire management actions or wildland fire suppression in areas already compacted or eroding could reduce the effectiveness of treatments or suppression by eliminating some types of treatments (prescribed burning, logging).

Using Land Health Standards to ensure water quality could also promote changes in FRCC and fuels. However, mitigation to avoid impacts on water quality could influence the location and extent of some fuel reduction treatments or wildland fire suppression, which could result in less effective treatments or direct suppression by reducing the acres treated or switching to a less effective suppression tactic.

Designing wildland fire management projects, including suppression and fuel reduction to avoid disturbance of historic properties could reduce their effectiveness in some instances.

Granting right-of-way, road use agreements, permits, and leases on public lands could increase access or use by the public, which could result in more human-caused fire ignitions.

Disposal of lands which are difficult or uneconomical to manage would promote efficiency in BLM's fire management program, including reduction of FRCC and fire suppression. Overall fire suppression access would be improved if these lands were disposed of. These tracts are often within the WUI, so disposal would reduce the BLM's responsibility for WUI lands.

Access management for lands and realty would promote gaining additional access, including acquiring additional lands. Additional access would provide better access for fire suppression, but also may improve public access, which could lead to additional human caused fires. Acquiring additional acres could increase the acres of WUI, or lead to additional acres with a higher FRCC.

Effects of Alternative A

Vegetation management actions (including salvage, timber harvesting, prescribed burning, small-diameter thinning, and thinning) would reduce densities of seedlings, saplings, and pole-sized trees and remove ladder fuels and other fuels to reduce the intensity of fires and to prevent wildland fires from spreading to the crowns of larger trees.

Fire suppression strategies under this alternative would allow for some flexibility to manage wildland fires, but a large percentage of fires could be controlled while still small in size.

Most BLM land in the Butte Field Office (258,200 acres, 85 percent) would be managed as Fire Management Category C. Fire and non-fire fuels treatments may be utilized to ensure constraints are met and to reduce undesirable effects of unplanned fires. Fuels reduction actions, including mechanical treatments and prescribed fire, would result in reduced wildland fire intensity and less potential for unwanted fires.

Alternative A would treat up to 12,780 acres per decade to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC. Compared to the rest of the alternatives, only Alternative C treats fewer acres.

In Alternative A Recreation Opportunity Spectrum (ROS) would be determined on a case by case basis. This would provide for the most flexibility for designing and planning fuels projects.

Alternative A has the second fewest acres designated in VRM Class I and II. This would provide for more flexibility for designing, planning, and implementation of fuels projects as compared to Alternatives B and C.

Sleeping Giant ACEC (11,679) management to protect naturalness and primitive recreation, along with no firewood removal of down dead and down material would affect fire management, particularly mechanical fuel reduction. Prescribed burning however could be used to reduce fuels and FRCC.

There are no seasonal timing restrictions for prescribed fire or mechanical treatments in this alternative. This would provide for the most flexibility for implementation of fuels treatments.

Effects Common to Action Alternatives

Wildland urban interface would be the top priority for hazardous fuels treatments. Those areas outside of WUI would be prioritized for treatment based on the historical fire regime and current condition classes. Funding for treatments within WUI and other fire dependent ecosystems would remain constant, and project level collaboration and coordination would continue with other agencies.

Fuels reduction in the WUI would result in removal of trees and shrubs to reduce the hazards associated with high intensity and severity wildland fires. Fuels reduction would decrease the density of trees and ground fuels and would result in reduced fire intensity and resistance to control.

Management to maintain fire-dependent ecosystems with fire regimes consistent with pre-suppression conditions would help maintain lower fuel levels and a reduced potential for high-severity fires.

Prescribed burning, mechanical treatments, and other appropriate methods would move toward restoring FRCC in grassland communities to historic conditions.

Meeting Land Health Standards equates to reducing or maintaining FRCC levels.

Emphasizing old forest structure (snag/down wood components and large diameter trees) could reduce the effectiveness of fire management actions, particularly in

the WUI where goals to retain old forest structure and fuel reduction goals may be in conflict.

Using FRCC to determine levels of fuel treatment outside the WUI would ensure that treatments maintain or move toward changing FRCC levels. In dry conifer and grassland types this would result in less intensive fire behavior. In cool, moist forest and riparian types, they could reduce fire behavior, but not necessarily.

Seasonal timing restrictions for big game winter and spring range, big game calving and grizzly spring and summer range could complicate the spring and early summer prescribed burning season and require additional mitigation.

Effects of Alternative B

Effects of fire management activities in Alternative B would be the similar to those described under Alternative A. However, no Fire Management Units (FMUs) would have any Category A designated lands, so prescribed fire could be used throughout the Decision Area (given other resource constraints).

Fire suppression under this alternative would be similar to Alternative A except it would allow for more flexibility to manage fires with no FMU Category A designations.

Relative to the rest of the alternatives, Alternative B would treat the second most acres (up to 34,650 acres per decade) to reduce fire intensity and behavior, improve wildland fire fighter safety, and maintain or move toward historic FRCC levels.

In Alternative B Recreation Opportunity Spectrum (ROS) would place 36,800 acres in Semi-primitive non-motorized. This could limit the flexibility for designing and planning fuels projects and implementing fire suppression. This may limit the opportunities and effectiveness of to reduce fire intensity and behavior, improve wildland firefighter safety, and change FRCC.

Alternative B would have the 75,100 designated in VRM Class I and II. This could limit the effectiveness and flexibility for designing, planning, and implementation fuels projects on those acres. This may limit the opportunities and effectiveness to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC, especially in areas of wildland urban interface.

There are seasonal timing restrictions for prescribed fire in this alternative. This may cause delays, increase costs, and possibly decrease effectiveness in reducing fire intensity and behavior, improving wildland fire fighter safety, and changing FRCC.

Effects of Alternative C

Alternative C would treat the fewest acres (up to 8,200 acres per decade) relative to the rest of the alternatives and therefore would do the least to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC.

Based on the acres of anticipated treatment and the percentage of the FMUs in Category A, it is estimated that a maximum of 100 acres per decade of treatments using fire could be eliminated in the Central Missouri FMU. The majority of these treatments would have occurred in dry forest and grassland types. The Missouri FMU includes approximately 37,000 acres of the 147,000-acre Missouri watershed. In Alternative C a maximum of 4,425 acres of treatment would occur in this watershed, indicating there would be no impact on the overall treatment planned because all fire treatments could occur in the remainder of the watershed designated as Category B or C. The Blackfoot (1,000 acres) and Gallatin (2,000 acres) FMUs are also designated as Category A, but in Alternative C, no treatments would occur in these watersheds.

Most BLM land in the Butte Field Office (approximately 243,000 acres, 79 percent) would be managed as Fire Management Category C. These areas would receive lower suppression priority in multiple wildland fire situations. Fire and non-fire fuels treatments may be utilized to ensure constraints are met and to reduce hazardous effects of unplanned fires. Fuels reduction actions, including mechanical treatments and prescribed fire, would result in more open forests, dominated by larger trees, with less potential for unwanted ignitions of intense wildland fires.

In Category A and B areas, fire suppression is a high priority to prevent unacceptable resource damage or to prevent losses of life or property.

Fire suppression strategies under this alternative would allow for the least amount of flexibility to manage fires, but more fires could be controlled at smaller sizes.

The flexibility of fire management strategies in Wilderness Study Areas under Alternative C would allow opportunities to manage larger fires for resource benefits.

In Alternative C Recreation Opportunity Spectrum (ROS) would place 63,700 acres in Semi-primitive non-motorized; the most acres of all the alternatives. This could limit the flexibility for designing and planning fuels projects and implementing fire suppression. This may limit the opportunities and effectiveness to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC.

Alternative C has the most VRM Class II lands (62,300 acres) of any alternative, which may affect the extent of some fire management actions and fuel treatments.

This may limit the opportunities and effectiveness to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC especially in areas of wildland urban interface.

This alternative has the greatest level of seasonal timing restrictions for prescribed fire and mechanical treatments. This may cause delays, increase costs, and possibly decrease effectiveness in reducing fire intensity and behavior, improving wildland fire fighter safety, and changing FRCC.

Effects of Alternative D

Alternative D would treat the most acres (up to 50,850 acres per decade) relative to the rest of the alternatives and therefore would do the most to reduce fire intensity and behavior, improve wildland fire fighter safety, and move toward historic FRCC levels.

Most BLM land in the Butte Field Office (approximately 265,000 acres, 86 percent) would be managed as Fire Management Category C or D, which are areas where fire is desired to manage ecosystems. These areas would receive lower suppression priority in multiple wildland fire situations. Fire and non-fire fuels treatments may be utilized to ensure constraints are met and to reduce hazardous effects of unplanned fires.

Fire suppression strategies under this alternative would allow for the most flexibility to manage fires with a smaller percentage of fires controlled at smaller sizes.

Flexibility in fire management strategies in Wilderness Study Areas would allow opportunities to manage larger fires for resource benefits.

Alternative D has the least VRM Class II lands (13,000 acres) of any alternative, which may affect the extent of some fire management actions and fuel treatments.

In Alternative D Recreation Opportunity Spectrum (ROS) would place 30,000 acres in Semi-primitive non-motorized. This could limit the flexibility for designing and planning fuels projects and implementing fire suppression. This may limit the opportunities and effectiveness of efforts to reduce fire intensity and behavior, improve wildland fire fighter safety, and change FRCC.

There are no seasonal timing restrictions for prescribed fire or mechanical treatments in this alternative. This would provide the most flexibility for implementation of fuels treatments.

Cultural and Paleontological Resources

Effects Common to All Alternatives

Since most resource uses/programs are discretionary, management measures under all alternatives include inventories to identify cultural and paleontological resources to allow for avoidance or mitigation of impacts. The greatest risk of damage or destruction of cultural resources across all alternatives results from non-discretionary development, casual, unauthorized activities (such as dispersed recreational activity, OHV use, and vandalism) and natural processes (natural decay, deterioration, or erosion). Under all alternatives, unquantified indirect impacts would occur. Cultural resources would continue to deteriorate through natural agents, unauthorized public use, and vandalism.

Achieving the Desired Future Condition for vegetation in riparian/wetland areas would be positive for cultural resources. Protection of cultural resources that occur in these fragile environments increases proportionately with the increase in the percent improvement towards DFC of riparian/wetland habitats.

Archeological sites in the same locations as livestock congregation areas are vulnerable to trampling. Historic buildings and sometimes rock art sites are vulnerable to livestock entry and rubbing. Grazing management which meets established Standards for Rangeland Health and Guidelines for Livestock Grazing should reduce the amount and extent of impacts or damage to cultural resources resulting from grazing on public lands.

All classes of cultural resources are vulnerable to impacts from timber harvest activity due to ground disturbance. The Butte Field Office has more sites recorded in the dry forest class than any other vegetation type. Sites located in cool forest types, grasslands and riparian areas are less vulnerable because of fewer proposed management actions. Activity in sagebrush areas fall in between the dry forest regimes and other vegetation classes. Inventories performed at the activity planning level would insure avoidance of known sites and localities from timber harvest and fuel management activities.

Threats to all classes of cultural resources from prescribed fires can be reduced with the proper use of protective measures. Sites vulnerable to fire damage will receive an evaluation prior to lighting, and if determined eligible, will receive protective measures as described in the burn plan for each project. In order to maximize the potential for locating vulnerable sites, BLM will focus on-the-ground inventory in both low and high-potential areas and also in areas where cabins and campsites are more frequently found. Survey will additionally be directed toward areas that contain historic mining properties. Based on the information recovered from these inventories, appropriate protective measures will be employed to reduce the potential risk from prescribed fire to vulnerable sites.

In some instances, cultural or historic sites would be damaged or destroyed by wildfire suppression efforts critical to protect human life or property. Under standard protocols, impacts to known cultural resources would be considered and mitigated. Rehabilitation efforts would generally increase the protection of cultural deposits that may have remained unaffected from wildland fire by preventing or reducing erosion and encouraging rapid revegetation of denuded surfaces. Potential impacts from rehabilitation activities (such as mechanical reseeding) would be mitigated under standard procedures.

The issuance of rights-of-way, leases and permits that result in ground disturbing activities have the potential to directly or indirectly impact cultural resources but impacts would be mitigated under standard avoidance or recovery procedures.

Acquisition of new land parcels would have a mixed effect on cultural and paleontological resources. On the one hand, more sites under the protection of federal preservation laws may be acquired. However, increasing access to public lands could have an indirect effect of exposing cultural resources to increased damage from illegal collection of artifacts and vandalism.

Impacts from dispersed recreational activity (camping, hiking, horseback riding, mountain biking, OHV use, rock climbing, etc.) are difficult to assess, particularly as such activities may impact cultural resources that have yet to be identified and recorded. Increased visitation and recreational use can lead to the illegal collection of artifacts and vandalism. Providing recreational or public interpretation of cultural and historic resources, such as those on the Lewis and Clark National Historic Trail, may enhance appreciation and understanding of the fragile and finite nature of cultural resources. Similarly, promoting the adaptive reuse of historic buildings and structures for recreational purposes would help preserve and protect significant historic properties, helping fulfill the requirements of Section 110 of the NHPA.

Under all alternatives, wheeled, motorized travel would be restricted to designated roads and trails throughout the majority of the Decision Area, thus reducing the potential for impacts caused by unregulated off-road travel. The potential for impacts to cultural resources is proportional to the number of miles open for travel in the Decision Area. Unimproved two-track roads and trails designated for use cut through sites, scattering and breaking artifacts and causing erosion problems. The noise level and presence of people can impact the use of traditional cultural properties by Native Americans in some instances.

Cultural resources would benefit directly from BMPs for visual resource management. Limiting visual intrusions preserves the setting of sites, which is especially important for cultural properties of religious importance to Indian tribes. SRMAs also provide intangible protection for sites with religious importance by providing enhanced visibility and solitude, as well as quieter environments.

Developing new, or upgrading existing, transportation facilities could result in the permanent mitigated loss of cultural resources. Again, increased accessibility to resources could lead to vandalism and unauthorized collection of artifacts, but conversely, could also facilitate the use of traditional locations by Native Americans.

The number of roads open or closed presents a mixed impact to cultural or paleontological resources. The maintenance and upgrades of those roads do present the potential for adverse effects to the sites and localities located in the area of disturbance; however less use on closed roads would halt current damage, and reduce the threat of future damage to sites.

Construction of new travel routes, or disking/ripping of decommissioned routes, threaten buried cultural deposits. However, regardless of the alternative, the first priority of planning is to preserve known sites by avoidance; therefore all proposed new travel routes, or routes that need to be disked or ripped for any reason, would be inspected first. This would enable travel plans to incorporate design alternatives and avoid disturbance to cultural resources.

Abandoned Mine Lands (AML) reclamation and remediation would have a direct impact to historic mining features and properties that may be mitigated by a number of methods. Remediation of open mines for safety purposes could have less impact using light construction that leaves most of the feature intact. In more comprehensive project areas, construction may be more intensive and require additional, more intensive data recovery.

Permitting for locatable minerals is non-discretionary and can result in total loss of cultural resources in the Area of Potential Effect. Inventory and planning can help save some properties, but remaining eligible properties would require some form of data recovery, depending on the use category assigned to the site.

Surface disturbing activities associated with leasable mineral sales and energy exploration and development could result in mitigated impacts to cultural resources. In addition, the potential for indirect and inadvertent impacts would increase proportionally to the amount of land available for mineral leasing and development.

No Surface Occupancy stipulations for oil and gas leasing and field development would help protect eligible cultural resources, traditional cultural properties and paleontological localities in the area.

Land use authorizations and land exchanges place resources at risk from development and also from loss of federal protections when those properties leave federal ownership.

Paleontological Resources

Management measures common to all alternatives would preserve and protect paleontological resources for present and future generations. The protective measures outlined for cultural resources would also be applied to any paleontological localities located during planning inventories, as per BLM Manual (8720). Unavoidable adverse effects would be mitigated through specimen recovery and analysis by permitted paleontologists in keeping with the significance of the locality.

Effects of Alternative A

Vegetation treatments under Alternative A would have a moderate impact on cultural resources, because this alternative would not reflect the high-end acreages proposed for vegetation treatments. Sites known to be in project areas, and those recorded in project areas during inventories, would be avoided during implementation.

The number of acres under VRM Class I would remain the same throughout all alternatives, but the number of acres in Class II in Alternative A would be much lower than Alternatives B and C. Since Classes III and IV would be managed on a case-by-case basis, it is not possible to determine if this alternative is more protective of visual resources than the others. Many more traditional cultural properties may or may not be adversely affected by this alternative, since the restrictions cannot be anticipated.

Alternative A would have the highest number of open roads and the lowest number of closed roads. More resources, both cultural and paleontological, would be impacted from increased access by motorized vehicles than with the other alternatives.

Effects Common to Action Alternatives

Increasing the number of acres of forest treatments would place more cultural resource sites and paleontological localities at risk.

The effects of designating varying fire use polygons cannot be directly measured, since suppression efforts can both help and harm cultural resources. Variable fire use polygons would have mixed effects on cultural resources. For example, traditional fire suppression efforts may damage buried cultural deposits in the process of protecting historic buildings with dozer lines. Since suppression efforts would be eliminated in Category D polygons, proactive inventories would help limit the potential for adverse effects on historic properties during wildfire events by altering suppression plans. Buried sites are less vulnerable than sites exposed on the ground surface, but high fire temperatures may still cause various physical alterations to artifacts and natural remains.

Development of recreation sites may have an adverse effect on cultural and paleontological resources. Those adverse effects would be mitigated by avoidance through redesigning the project, or data recovery if the site or locality could not be avoided.

Road closures would have a beneficial effect on cultural and paleontological resources from reduced compaction, reducing exposure of resource deposits from the unrestricted development of two-track roads, and reduced chances of vandalism from access to remote areas with vehicles.

Designating the Humbug Spires, Sleeping Giant, Sheep Creek, and Elkhorns Tack-on WSAs as ACECs under all action alternatives would protect cultural and paleontological resources in these areas, due to greater restrictions placed on ground-disturbing activity.

Since the value of many traditional cultural properties is based on a high level of air quality and a natural appearance to the landscape, dropping the Black Sage and Yellowstone Island VRM Classes from I to II (in the event Congress eliminates them from wilderness consideration) would present an adverse effect to traditional cultural properties in the viewsheds of these two areas. Increasing the amount of Class IV acreages would be detrimental to traditional cultural properties in those viewsheds.

Public education is enhanced from interpretive efforts planning for the Elkhorns ACEC.

Disposal of the approximately 8,901 acres identified for disposal under all action alternatives could place approximately 24 cultural resources at risk, as per the site dispersal average for the Decision Area. Inventory and evaluation on a case-by-case basis would alleviate that risk.

The two energy corridors that would be designated under all action alternatives received considerable mitigation measures prior to construction. Adding utilities to these corridors would not impact cultural or paleontological resources.

Oil and gas leasing and resource development does not differ significantly enough between alternatives. This activity would put both cultural and paleontological resources at risk and would require site-specific mitigation. This would be done through project redesign and avoidance where possible, and if the resources cannot be avoided, data recovery would be used. Stipulations attached at the time of leasing, and again prior to development as part of the overall NEPA process, would protect prehistoric sites, traditional cultural properties, and paleontological localities.

Effects of Alternative B

Increasing the amount of decadal vegetation treatments in both the dry forest and shrubland types may affect a proportional number of sites. However, inventories performed ahead of project implementation would mitigate the impacts to cultural resources. Increasing the number of acres managed at VRM Class II would improve the visual quality of traditional cultural properties in those viewsheds.

Protecting soils would protect valuable deposits of both paleontological and cultural resources. More cultural and paleontological resources would be threatened under Alternative B than under Alternative C from higher levels of ground disturbing activities. This would also be the case for travel management under Alternative B where decommissioned roads that may require ripping or additional blade work.

Effects of Alternative C

Under Alternative C, upper-end acreages of proposed dry forest treatment acres would put fewer cultural and paleontological resources at risk than in any other alternative due to the significantly lower amount of ground disturbance from treatment activity. Visual resource management in this alternative would be the most beneficial to traditional cultural properties where the viewshed is an integral component of the value of the site. While Alternative C would not increase the acreage managed under VRM Class I, it would provide for the greatest increase in acres managed under Class II and Class III, and the fewest acres managed under Class IV; and as such, would allow the fewest intrusions into the natural viewsheds remaining in the Decision Area.

Traditional cultural properties would benefit most from the lowered development/disturbance scenario in Alternative C. Less activity would result in less noise and visual impacts, as well as disturbance from other public land users. Alternative C would also result in the fewest consultations with Native American tribal governments. Alternative C would create the least risk overall to cultural and paleontological resources due to its lowest proposed amount of development and soil disturbance.

Effects of Alternative D

Under Alternative D, upper-end increases in proposed forest treatment acres would put more cultural and paleontological resources at risk than under the other three alternatives.

Visual resources managed under Alternative D would undergo more impacts than under either Alternative B or C, especially from a substantial drop in VRM Class II lands. The acres managed as VRM Class IV under Alternative D would be much higher than this acreage under Alternative C, but not much higher than under Alternative B. The Alternative D pattern of visual resource classes would have a more negative impact on traditional cultural properties that depend on the quality of the viewshed compared to Alternatives B and C.

Cultural and paleontological resources would be most vulnerable under Alternative D because of the increased risk of disturbing subsurface deposits. However, since avoidance of known sites is BLM policy, it does not necessarily follow that development would result in an increased amount of damage to cultural resources, paleontological localities, and traditional cultural properties. Because both resources are at greatest risk under alternative D than any other alternatives, more project-level planning and/or mitigation would be required with this alternative than with any of the other alternatives.

Visual Resources

Effects Common to All Alternatives

Timber cutting and thinning could reduce the visual quality temporarily with regard to apparent modifications in color, line, and texture especially in sensitive viewing areas; however, projects would be designed to meet VRM classification objectives. Management in dry forest types would present the most potential for impacts on VRM objectives, as treatment acres would be the most extensive for this type.

Management in cool moist forests would generally be aimed at maintaining a diversity of age-classes (uneven-aged management). Generally, visual resource values could be maintained while selective cutting treatments are accomplished. An exception is lodgepole pine stands, which would require more even-aged management or clearcuts and therefore a higher potential for noticeability. Treatments that have long-term impacts on visual quality would be designed or mitigated to meet VRM objectives. Some treatments may be precluded if they are proposed in VRM Class I and II areas.

There may be some short or mid-term reductions in overall visual quality due to vegetation management actions in VRM III and IV areas. Because VRM would be considered during project planning, the overall VRM would be met over the long-term, but some activities (cutting or burning) may be visible during the short-term.

Protection and enhancement of riparian conditions would generally improve visual resources over the mid to long-term due to greater color and texture diversities and overall healthier appearances.

Limiting the spread of noxious weeds would be beneficial as the natural appearance of landscapes would be enhanced.

Wildland fire suppression and management actions for fire (wildland fire use, prescribed fire, and fuel reduction) may result in a short-term reduction in visual quality, however, these actions would promote long-term benefits as fewer acres would burn in an uncharacteristically large or severe manner. In addition to reducing the potential for severe wildland fires, these actions could also benefit visual resources by creating open vistas and more diverse landscapes with park openings and interspersed shrubs and trees. Due to fire suppression priorities and vegetative treatments, areas outside of the Wildland Urban Interface (WUI) would see more visual effects from wildland fire than those within the WUI.

Protection of Wilderness Study Areas, eligible Wild and Scenic River segments, ACECs, and National Trails would maintain visual resources and meet VRM objectives barring large-scale wildland fire events, substantial outbreaks of insect/disease occurrences to trees, or other natural alterations.

Following BLM Handbook H-8341-1 and mitigating short- and long-term visual impacts would help protect visual quality.

VRM I and II classifications would do the most to protect visual quality in the Decision Area and reduce the risk of visual quality impacts compared to other VRM classes. Alternatives with the most acres in VRM I and II would be the most protective of visual quality. VRM III and IV classifications would have the most potential to put visual resources at risk.

Minimizing or preventing air quality degradation would benefit visual quality by reducing the risk of degraded air quality (smoke obstructing viewpoints, etc.).

Depending on where land exchanges, ownership adjustment, or disposal occur, visual quality could be improved or negatively impacted. Negative impacts could occur where open, undeveloped tracts of land are disposed of and later developed.

Although VRM would be considered in land use authorization and access decisions, there is the potential for rights-of-way allocations to impact visual quality due to related disturbances with road building, vegetative removal, and new improvements.

Project proposals for mineral and energy exploration and development would be managed to prevent unnecessary and undue degradation; however, these activities could affect visual resources within the Planning Area. Mineral development outside special management areas could result in undesirable visual effects. These effects may be long-term. However, reclamation plans would consider visual restoration, so effects may not be permanent.

Restoring abandoned mines would improve visual quality in the areas where these disturbed sites are reclaimed and vegetated.

Effects of Alternative A

Approximately 5,250 acres per decade of vegetation treatment activities in grasslands and shrublands would continue to pose potential impacts to visual resources due to modifications in color, texture, and form. Some vegetation management actions could cause short-term negative impacts while long-term effects would be enhanced due to improved vegetation conditions and reduced wildfire risks.

Timber harvesting and salvage would be designed to meet established VRM objectives, so there would be minimal effects on visual resources except in limited situations where such actions were noticeable.

Although prescribed fire would be designed to meet VRM objectives, there would be potential for short to mid-term impacts on visual quality. These actions would ultimately lower the long-term risk for large-scale wildland fires. Wildland fire is considered a natural event (not human-caused fires) but it also changes the current condition of the visible landscape; therefore, wildland fire in VRM Class I and II areas could adversely impact visual resources to the greatest extent.

Discouraging timber cutting immediately adjacent to clearcuts, as required in elk management guidelines, would discourage the softening of edges that could be used to mitigate visual impacts created by clearcuts in noticeable areas. Conversely, this stipulation would benefit visuals in that additional adjoining clearcuts with large-scale modifications to the landscape would be prevented.

Continued management of six WSAs under Interim Management Guidelines would result in approximately 31,500 acres managed as VRM Class I.

Protective management on the Missouri River and Moose Creek eligible Wild and Scenic River segments would provide long-term visual resource protection and is important given that one of their outstanding remarkable values is Scenic. Current management of the major river corridors including the four eligible WSR segments would result in about 25,400 acres protected as VRM Class II. This classification would ensure that these sensitive viewsheds and their visual values would be retained. Since the Headwaters RMP did not distinguish between VRM Class III and IV areas, project-specific distinction would create increased workloads for visual management during project level planning.

Because Recreation Opportunity Spectrum (ROS) class has a component of VRM, not classifying ROS under Alternative A puts maintaining VRM to meet public preferences at a higher risk in the undesignated Class III and IV areas.

Management classes assigned to specific areas determine the amount of mitigation necessary to protect visual resources, which would allow at least partial modification of the landscape in nearly 81 percent of the BLM surface acres (VRM Class III and IV areas).

Areas withdrawn from mineral entry (6,300 acres) would continue to protect visual resources from locatable mineral actions. Impacts from salable mineral actions could potentially impact visual resources over the short and mid-term until reclaimed due to vegetative removal and excavation contrasts. The Controlled Surface Use oil and gas leasing stipulation for mapped VRM Class II, III, and IV areas would minimize visual impacts on 248,849 acres under Alternative B. However, of these 248,849 acres, approximately 66,962 acres would be even more protected from visual impacts due to being overlapped by other NSO stipulations or No Lease areas.

Effects Common to Action Alternatives

There may be some short or mid-term reductions in overall visual quality due to grassland and shrubland treatments in VRM Class II and III areas. Because VRM objectives would be considered during project planning,

the overall VRM class objectives would be met, but some activities may be visible.

Maintaining residual stands that survive large-scale disturbance events would maintain visual quality.

Prevention of noxious weed invasion would maintain visual quality along roads, trails, urban interface areas, and recreation sites.

Thinning adjacent to clearcuts would not be discouraged, leaving open the opportunity to mitigate existing and future "hard edges" created by clearcuts if needed to improve visual quality and meet VRM objectives.

Meeting Land Health Standards on existing or future developed recreation sites would improve visual quality.

Continuing to manage the Sleeping Giant area as an ACEC would result in 11,679 acres of VRM Class II protection.

WSAs removed from wilderness consideration by Congress and not designated as ACECs (Black Sage and Yellowstone River Island) would see a reduced level of protection for visual quality. These lands are currently in VRM Class I, and in the future would be managed as VRM Class II.

Reseeding disturbed areas would maintain or improve visual quality.

Effects of Alternative B

Effects from the management of dry forests described above under "Effects Common to All Alternatives" would occur on up to 14,750 acres per decade in this alternative.

Treatment of up to 15,450 acres per decade of grassland and shrubland habitat could create short to mid-term impacts to visual quality due to changes in color and texture. Short to mid-term impacts would promote long-term visual benefits due to the reduced potential for large-scale wildland fires resulting from these treatments.

Designating approximately one third of the Decision Area lands as ROS semi-primitive non-motorized, and semi-primitive motorized would provide additional management direction for protection of visual resources since new developments would not be compatible with these settings and a management emphasis would be made to retain the natural character of these areas.

Effects from potential mining activity on visual resources would be similar to those described for Alternative A. Actions lowering potential impacts under Alternative B compared to Alternative A, are that open road mileage would be reduced, 198 additional acres would be recommended for withdrawal from locatable mineral entry, and 13,968 fewer acres would be open to oil and gas leasing subject only to standard lease terms. However, Alternative B would still have 18,404 more acres open to oil and gas leasing than Alternative A. The Controlled Surface Use oil and gas leasing stipulation for mapped VRM Class II, III, and IV areas would minimize visual impacts on 248,849 acres under Alternative B. However, of these 248,849 acres, approximately 87,765 acres (20,803 more acres than under Alternative A) would be even more protected from visual impacts due to being overlapped by other NSO stipulations or No Lease areas. This would be more protective than Alternatives A and D (where standard lease terms would apply), but less protective than Alternative C.

An additional 23,500 acres would be classified as VRM Class II (compared to Alternative A) due to adjustments made for sensitive visual areas primarily along major rivers. This classification would prevent basic element changes to the landscapes that are evident. Acres by VRM Class are displayed in **Table 4-14.**

Table 4-14
Alternative B – Acres by VRM Class

VRM Class	Alternative A	Alternative B
I	31,500	31,500
II	25,400	48,900
III	250,400*	125,200
IV	N/A	101,700

* VRM III and IV are combined in Alternative A

Effects of Alternative C

Effects from management of dry forests would be the same as described under "Effects Common to All Alternatives" on up to 4,800 acres per decade, the least of any alternative.

Effects from management of cool, moist forests would be the same as described under "Effects Common to All Alternatives" on up to 550 acres per decade, the least of the alternatives.

Up to approximately 2,750 acres of grassland and shrubland vegetation treatment would be proposed in Alternative C. Effects on visual quality would be the same as described under Alternatives A and B although to a lesser extent. Alternative C would provide for the lowest number of grassland and shrubland treatment acres of any alternative.

The quantity of forest products removed and new roads constructed to support management for forest products would be the lowest of any alternative and therefore visual resources would be least impacted by these activities of any alternative.

Alternative C would provide for the highest acreages (125,300) to be managed as semi-primitive non-motorized and motorized ROS classes and therefore would provide greater protection for visual resources than any other alternative.

Effects from WSA and ACEC management would be similar to those of Alternative B. However the recommendation that all four eligible Wild and Scenic River segments be found suitable in Alternative C would potentially provide the greatest protection of visual resources of all alternatives in these areas since visual disturbances would be minimized.

Under Alternative C, adverse effects of energy and mineral exploration and development on visual resources would be the least of all alternatives. Supporting roads could not be constructed within riparian areas. Approximately 580,382 acres (approximately 89 percent of Decision Area total) would not be open to oil and gas leasing. The Controlled Surface Use oil and gas leasing stipulation for mapped VRM Class II, III, and IV areas would apply to 246,118 acres. However, of these acres, approximately 224,294 acres would be even more protected from visual impacts due to being overlapped by other NSO stipulations or No Lease areas. This would be the most protective of all alternatives. Salable mineral uses would be limited to existing community pits unless needed by the state or counties. Approximately 378 acres would be recommended for locatable mineral withdrawal.

Overall Alternative C provides the most protection to visual quality (**Table 4-15**) of all the alternatives.

Table 4-15
Alternative C – Acres by VRM Class

VRM Class	Alternative A	Alternative C
I	31,500	31,500
II	25,400	67,600
III	250,400*	151,800
IV	N/A	56,500

* VRM III and IV are combined in Alternative A

Effects of Alternative D

This alternative would entail the greatest amount of vegetative treatments and therefore would have the greatest potential impacts to visual resources due to short and mid-term changes in colorations and texture. Effects of dry forest management would be the same as described under "Effects Common to All Alternatives" on up to 18,200 acres per decade, the most of any alternative.

Effects of cool, moist forest management would be the same as described under "Effects Common to All Alternatives" on up to 5,050 acres per decade, also the most of any alternative.

Alternative D would provide for up to 25,900 acres of vegetative treatment in grasslands and shrublands that could impact visual quality, the most of any alternative. Types of effects would be the same as described under Alternative A.

Potential effects from forest products removal, including timber salvage would be the highest under this alternative given the increases in projected potential timber harvest.

Black Sage and Yellowstone River Island WSAs would be subject to increased visual impacts from mineral activities if Congress releases these areas from wilderness consideration.

This alternative would have the fewest acres designated in the relatively protective VRM Class II lands than the other alternatives and therefore visual resources would be subject to more impacts than in the other alternatives.

No Wild and Scenic River segments would be recommended as suitable and no interim protective measures would be imposed for Wild and Scenic Rivers. As a result, visual resources within these segments would be prone to more impacts than with any alternative.

Alternative D would open the highest acreage (54,079 acres) to oil and gas leasing subject to standard lease terms and would not include the Controlled Surface Use stipulation on VRM Class II, III, and IV lands. Therefore Alternative D would present the highest potential for impacts to visual resources due to oil and gas development of any alternative. Effects from other energy and minerals activities would be similar to those described for Alternative A.

Alternative D would provide the least protection for preserving visual quality (**Table 4-16**). Alternative D has the fewest acres in ROS classes of semi-primitive non-motorized and semi-primitive motorized of any action alternative and therefore would have the highest risk that visual quality would not be protected. However, because Alternative A does not establish ROS, this alternative would have more protection for visual quality than Alterative A.

Table 4-16
Alternative D – Acres by VRM Class

VRM Class	Alternative A	Alternative D
I	31,500	31,500
II	25,400	6,600
III	250,400*	142,900
IV	N/A	126,300

* VRM III and IV are combined in Alternative A.

EFFECTS ON RESOURCE USES

FORESTRY AND WOODLAND PRODUCTS

Effects Common to All Alternatives

There would be no effects to forestry and woodland products from proposed management associated with livestock grazing, noxious weeds, cultural resources,

paleontological resources, energy and minerals, abandoned mine lands, hazardous materials management, farm lands, environmental justice, or tribal treaty rights.

Under all alternatives, management of any forest type that involves forest product removal would result in a contribution to the achievement of the PSQ. Types of products, size, and acres treated vary across the alternatives. Management actions would partially meet the public demand for wood products by providing sawtimber, posts and poles, and biomass, while improving forest health.

Vegetation treatments in grasslands, shrublands and riparian areas to remove conifer encroachment would provide some forest products, including posts, poles, biomass, and a limited amount of sawtimber. There are approximately 147,715 acres of land in the Decision Area (over 10 percent canopy closure and not in VRM Class I or WSA) from which commercial forest products and biomass could be produced through mechanical treatments. Prescribed burning could possibly remove some potential forest products, although effects would be limited as most of the material burned would be non-merchantable. In the long-term, prescribed burning and mechanical treatments could increase the value of forest products by increasing their quality (better growth form) and size (due to increased availability of nutrients and water).

Treating areas to reduce the risk of developing epidemic levels of forest insect or disease would provide forest products as a by-product of the treatment. However, preventing mortality from these sources could reduce the amount of salvage volume available in the future. In many cases however, treatments would reduce the severity of wildland fire, which could, in the long-term lead to increased quantities of forest products being available in the future.

Maintaining adequate access for forest/woodland management programs would help to maintain the economic feasibility of some treatments. The necessity to build roads (even temporary roads) can be cost-prohibitive particularly with smaller projects.

Management actions are expected to include design and BMP provisions for the protection of forest health, natural resources, water quality, and soils, which can limit the size and location of treatments and the removal of forest products. Streamside management zones would affect the methods used and outcome of forest products in those portions of riparian areas that are regulated under state law.

Providing small sale opportunities would help to meet local public demand for vegetative resources, including house logs, posts and poles, vegetative cuttings, conifer boughs, wildlings and ornamentals, grape stakes and juniper products, specialty cuttings, and wildflowers.

Limiting tractor logging to slopes averaging less than 40 percent would require that alternative methods of logging would be used. These alternative methods are generally more expensive than traditional ground based logging however; this is a common practice that the market is adapting to.

Slash disposal, site preparation and natural or artificial revegetation would promote re-establishment of the forest following treatment, which would lead to additional forest products in the future.

Enhancing riparian and wetland resources could result in some removal of forest products, because of the conifer removal component present in many prescriptions for these areas.

In the short term, fire suppression under all alternatives would maintain the availability of live forest products, and reduce the amount of salvage products. In the long-term however, fire suppression is likely to result in more uncharacteristically large and severe wildland fires that exceed suppression capabilities and result in an overall loss of forest products through fire consumption. An additional long-term effect could be future timber salvage opportunities if wildland fire size increases, along with vegetative type conversion from forest to grass or shrublands in severely affected areas that eliminate local sources of conifer seed.

Wildland fire use (allowing wildland fires to burn) and restoration of historic fire regimes would improve forest health in the long-term. Wildland fire use could produce salvage opportunities in the short term.

Fuels treatments to reduce wildland fire hazards would produce forest products in cases where by-products can be removed and used.

Management measures to protect special status species and priority species would affect the timing, location, or extent of most forest products removal projects. These effects would vary from minor to prohibitive. Management measures could also affect the economic viability of projects by limiting the intensity of management, the amount and type of products removed, the tools used, and the timing of activities. Timber removal may also be used as a tool to improve/restore special status species habitat, so activities to improve habitat for these species could, in some cases, produce forest products.

Forest product removal would be allowed under any of the Recreation Opportunity Spectrum classes established in the Planning Area. However, the more restrictive classes make management for overall forest products more difficult or expensive by restricting the level of disturbance or access to the management areas. Economically, this combination can be prohibitive, particularly where treatment prescriptions restrict removal of high value materials, specialized equipment is required, access is in need of considerable development, or the landing sites are inaccessible from the treatment site. In

particular, areas classified as Semi-primitive non-motorized would require inconspicuous treatments. Semi-primitive motorized areas could also be considered restrictive on a case-by-case basis.

Wilderness Study Areas would not have any forest product removal.

For all alternatives, the effects of Wild and Scenic River designations would be related to the subsequent river management plans and associated VRM and ROS classes.

VRM Class I areas are already set aside as Wilderness Study Areas, so there would be no additional effect beyond those described for WSAs. For VRM Class II areas, large-scale removal of sawtimber would be prohibited in most cases, which would restrict silvicultural management of those areas for forest products. Many activities that produce forest products could occur. However, economic efficiency would often be reduced due to less intensive activities, the need to leave more trees, and the need for non-intrusive road access. Most activities that produce forest products would be compatible with VRM Class III. VRM Class IV areas would have no effect on forest product activities.

Management of the Sleeping Giant ACEC (11,679 acres) to protect naturalness and primitive recreation, along with not allowing firewood removal of dead and down material, would minimize forest product removal from this area, although it would remain in the commercial forest category.

Requirements to comply with local, state, and federal requirements and mitigations for air quality may restrict slash disposal using prescribed burning related to some forest products removal actions, but this would not be expected to affect the overall achievement of PSQ, economic value, or meeting demand.

Implementing BMPs and mitigations for soil may affect logging and slash disposal related to the practices and timing used for some forest products removal actions, but would not be expected to affect the overall achievement of PSQ or meeting public demand. Measures to protect steep slopes, water quality or limit soil erosion could increase the cost of forest products removal by limiting operating periods, access, equipment types, or requiring aerial logging methods.

Implementing BMPs and mitigations for water quality may affect logging and slash disposal related to some forest products removal actions, but would not be expected to affect the overall achievement of PSQ or meeting public demand. Measures to comply with the Montana Streamside Management Zone (SMZ) Law and state water quality rules could reduce the amount of timber that could be removed and increase the cost of forest products removal by limiting operating periods and access or requiring aerial logging methods. Forest management costs may also increase as state consultation and approval is required if alternate practices are needed to complete a timber removal project within an SMZ.

Providing rights-of-way, road use agreements, permits and leases could improve access for forest products management activities, which could increase economic viability.

Land tenure adjustments would result in more efficient management of forest products, which would improve economic viability and could improve BLM's ability to meet forest product demand.

Acquiring permanent access easements where needed would improve forest product removal efficiency and help meet public demand for forest products. Improved efficiency would result in better economic viability by providing assured access for later treatments and smaller scale activities and sales.

Effects of Alternative A

Table 4-17 displays the predicted output of forest products for Alternative A, given the resource protections detailed in the alternative description.

Table 4-17
Alternative A – Decadal Forest Products Output

Product	Amount
Dry Forest	3,600 acres of timber and 1,000 acres of small-diameter thin
Cool Moist Forest	2,350 acres of timber and 50 acres of small-diameter thin
New Permanent Road Construction	55 miles
PSQ	12 to 27 MMBF
	40,000 to 97,000 CCF
Estimated Number of Permits Issued for Forest Products	350 Permits
Christmas Trees	4,500 Trees
Cords of Firewood	750 Cords
Small Timber Sales (Included in with PSQ)	1,650 MBF Sawtimber
Post, poles, Biomass, other woody materials	55 CCF
Timber Salvage	No Limit

Under Alternative A, mechanical treatment of vegetation in riparian areas could produce a few forest products from 30 acres per decade.

Compliance with SMZ Law would allow for forest product removal in SMZ areas solely for the economic purposes without meeting any riparian or other resource management objectives discussed in Alternatives B and C. Alternatives A and D also allow for a more aggressive approach to forest product removal in the riparian areas outside of the SMZs than the other alternatives.

Fire suppression within the first burning period of wildland fires would limit the loss of forest products to fire. Wildland fire use and prescribed burning could cause a loss of forest products, but could also create salvage opportunities in the short run while increasing the amount of products available in the future through improvement of forest health.

Alternative A has 240,000 acres in fire management Category C, which creates the potential for salvage opportunities on most of the DA.

In addition to the effects from special status and priority species management described under "Management Common to All Alternatives", guidelines in the Montana Cooperative Elk Logging Study would limit the extent and timing of some forest products removal projects.

Under Alternative A, the recreational (ROS) and visual values (VRM) and opportunities could be considered on a case by case basis and may affect product removal dependant on individual analysis of impacts for each project. This is not expected to affect overall product removal levels nor support of the PSQ under Alternative A.

In addition to the effects described under "Effects Common to All Alternatives" for the Sleeping Giant ACEC, vegetation management in the Humbug Spires ACEC could result in limited forest products, although trying to meet primitive recreation goals would preclude removal of sawtimber or construction of roads for access, adversely affecting the economic viability of forest products projects.

Effects of Alternative B

Table 4-18 displays the predicted output of forest products for Alternative B, given the resource protections detailed in the alternative description.

Timber salvage would produce sawlogs and other timber products, although Alternative B limits salvage compared to Alternative A.

Riparian treatments could produce a limited number of forest products, as riparian management objectives would dictate treatment type and level of forest change needed to meet objectives in the Riparian Management Zones (RMZs). Assuming a site-potential tree height of 80 feet, RMZs would limit the location and access to forest product removal projects in corridors defined as 160 feet on either side of fish-bearing streams and amounting to 38 acres per mile of stream, 80 feet on either side of non-fish bearing streams and amounting to 19 acres per mile of stream, and 50 feet on either side of intermittent streams which amounts to 12 acres per mile of stream. In these areas under Alternative B, treatment method, heavy equipment use, and vehicular access would be restricted to meet riparian objectives or prevent riparian impacts, thus reducing product removal efficiency and increasing cost. Under Alternative B, product removal would be allowed, while it would be prohibited under Alternative C. Alternatives A and D would allow for greater flexibility of product removal, because SMZ widths would be narrower than the RMZ widths.

Fire suppression within the first burning period (first day of a wildland fire) would limit the loss of forest products to fire. Wildland fire use and prescribed burning could

Table 4-18
Alternative B – Decadal Forest Products Output

Product	Amount
Dry Forest	4,150 to 14,750 acres of timber and 300 to 1,000 acres of small-diameter thin
Cool Moist Forest	450 to 3,750 acres of timber and 100 to 400 acres of small-diameter thin
New Permanent Road Construction	Kept to a minimum, closed to public
PSQ	9 to 25 MMBF
	33,000 to 91,000 CCF
Estimated Number of Permits Issued for Forest Products	450 Permits
Christmas Trees	5,500 Trees
Cords of Firewood	1,000 Cords
Small Timber Sales (Included in with PSQ)	2,100 MBF
Post, Poles, Biomass, other woody materials	77 CCF
Timber Salvage	Variable, selective prescriptions considering the event size and associated wildlife values.

cause a loss of forest products, but could also create salvage opportunities. Alternative B is similar to Alternative A with 262,000 acres in fire management Category C, slightly higher than Alternative A at 258,200 acres. Management actions to reduce fuels in the Wildland Urban Interface and restore historic fire regimes in forested types could also produce forest products.

Timing restrictions for migratory birds prohibiting management-ignited prescribed fire from May 1st through August 30th would not reduce the availability of forest products for consumption. Disposal of slash and site preparation activities by burning may be restricted in higher elevation and north slope timber sale sites in the spring after May 1st, thereby increasing the cost and reducing the effectiveness of such activities.

Allowing no net increase in permanent roads in big game winter/calving range and grizzly bear distribution zone areas with low road density (defined as 1 mi/mi^2 or less in Alternative B) would reduce product removal efficiency in active forest management areas. Construction of more temporary roads would be necessary with most projects implemented. This also would limit the public's ability to use forest product permits in those areas.

Forest and woodland stands designated as ROS Semi-primitive non-motorized (18,554 acres), and Semi-primitive motorized (26,283 acres) under Alternative B amount to 41 percent of the forest and woodland available for product removal in the Decision Area. Forest product removal treatments and access development in these areas would be required to have relatively inconspicuous impacts on landscape character. This requirement could lead to increased costs due to a need for: more careful project design, more restrictions to protect recreation settings, and specialized equipment for implementation. Quantities of forest products removed may also decrease. Some commercial projects that would be feasible under Alternative A would not be feasible under Alternative B in these areas. Public use of the non-motorized designated areas for forest products, such as firewood and Christmas trees, would fall to very low levels, as the harvested materials would have to be hand carried to vehicles and would probably only occur on the periphery of these non-motorized areas.

Forest and woodland stands designated as VRM Class II under Alternative B (16,902 acres) amount to 15 percent of the forest and woodland available for product removal in the Decision Area and are stands mainly found in areas designated as ROS Semi-primitive non-motorized. Forest product removal treatments would be restricted because treatments could not attract the attention of the casual observer in these areas. This would substantially reduce the level of product removal compared to Alternative A in VRM Class II areas.

In addition to the effects described under "Effects Common to All Alternatives" for the Sleeping Giant ACEC, vegetation management in the Humbug Spires ACEC could result in limited forest products removal, although trying to meet primitive recreation goals would preclude removal of sawtimber or construction of roads for access, adversely affecting the economic viability of forest products projects.

The Ringing Rock ACEC (160 acres) could produce forest products as long as VRM II could be met. Vegetation management in the Elkhorns ACEC (50,431 acres) would produce forest products and contribute to meeting public demand, except for the 3,575 acres of the Elkhorn Tack-on Wilderness Study Area, where forest products removal would be prohibited.

Timber salvage would be unlikely in any ACEC and would be prohibited in the Elkhorns ACEC, except when needed to provide for public safety.

Effects of Alternative C

Table 4-19 displays the predicted output of forest products for Alternative C, given the resource protections detailed in the alternative description.
Maintaining and promoting old forest structure and condition may produce a limited amount of small forest products.

Table 4-19
Alternative C – Decadal Forest Products Output

Product	Amount
Dry Forest	2,050 to 4,800 acres of timber and 55 to 250 acres of small-diameter thin
Cool Moist Forest	50 to 550 of timber and up to 50 acres of small-diameter thin
New Permanent Road Construction	No new permanent roads
PSQ	5 to 12 MMBF
	19,000 to 41,000 CCF
Estimated Number of Permits Issued for Forest Products	150 Permits
Christmas Trees	4,500
Cords of Firewood	50 Cords
Small Timber Sales (Included in with PSQ)	500 MBF
Post, Poles, Biomass, other woody materials	55 CCF
Timber Salvage	50 percent of affected area must be retained.

Timber salvage would produce sawlogs and other timber products; however Alternative C limits salvage more than the other alternatives. Salvage projects under Alternative C would be smaller and occur less often than the other alternatives due to higher large tree retention requirements and the areas where timber salvage would be prohibited (50 percent of contiguous areas of 1,000 acres or larger).

Requiring firewood to be live trees would eliminate the current agreement with the Forest Service for firewood permits and increase administration and enforcement cost. Green tree removal could result in fewer firewood permits overall because green trees are not desirable for firewood. Alternative C would not contribute to meeting public demand as well as the other alternatives would. No commercial forest products would be removed from RMZs under Alternative C, making Alternative C the most impactive alternative to commercial forest products from a riparian management standpoint. Under Alternative C Riparian Management Zones would be defined as 300 feet on either side of fish bearing streams and amounting to 73 acres per mile of stream; 150 feet on either side of non-fish bearing streams and amounting to 36 acres per mile of stream; and 50 feet on either side of intermittent streams which amounts to 12 acres per mile of stream.

Fire suppression within the first burning period (first day of a wildland fire) would limit the loss of forest products to fire. Wildland fire use and prescribed burning could cause a loss of forest products, but could also create salvage opportunities. The potential opportunity for timber salvage after fire events under Alternative C is similar to Alternative A, with 240,000 acres in fire management Category C compared to 258,200 acres in Alternative A. Management actions to reduce fuels in the Wildland Urban Interface and restore historic fire regimes in forested types could also produce forest products.

Under Alternative C, timing restrictions to protect migratory birds would prohibit vegetation treatments from May 1st through August 30th (unless breeding bird surveys document low potential for impact). This restriction would tend to push mechanical vegetation treatment, product removal, slash disposal and site preparation activities into the fall and winter under Alternative C. As this restriction is geared toward widespread disturbance of vegetation and potential nesting sites, it is not expected to affect the timing of more focused treatment support activities such as road maintenance or temporary construction which could be conducted during the restriction period. This should not reduce the availability of forest products for consumption, but this may increase the cost due to work being conducted during adverse winter conditions and when snow plowing may be required for anticipated heavy truck traffic to landings.

Under Alternative C, effects from special status and priority species management would generally be similar to Alternative B. However, allowing no net increase in permanent roads in big game winter/calving range and grizzly bear distribution zone areas with low road density (defined as 1.5 mi/mi^2 or less in Alternative C) would affect more areas, the most of any alternative. Additionally, maintaining blocks of at least 500 acres as unroaded or having closed roads during the hunting season may limit public access for forest products permits and access for management actions.

Forest and woodland stands designated as ROS Semi-primitive non-motorized (23,895 acres), and Semi-primitive motorized (31,583 acres) under Alternative C amount to 50 percent of the forest and woodland available for product removal in the Decision Area. Effects from area designations of ROS Semi-primitive classes would be similar to those described for Alternative B.

Forest and woodland stands designated as VRM Class II under Alternative C (27,259 acres) amount to 25 percent of the forest and woodland available for product removal in the decision area. Effects from area designations of VRM Class II would be similar to those described for Alternative B.

Effects from ACEC management would be the same as under Alternative B.

Effects of Alternative D

Table 4-20 (page 446) displays the predicted output of forest products for Alternative D, given the resource protections detailed in the alternative description.

Maintaining and promoting old forest structure and condition may produce a limited amount of small forest products.

Timber salvage would produce sawlogs and other timber products, although Alternative D limits salvage compared to Alternative A. Salvage projects under Alternative D would probably be larger and occur more often than under Alternatives B and C.

Alternative D would be most effective at meeting public demand for small sale products of all alternatives.

Fire suppression within the first burning period (first day of a wildland fire) would limit the loss of forest products to fire. Wildland fire use and prescribed burning could cause a loss of forest products, but could also create salvage opportunities. Because Alternative D has the most acres in Category D (180,000 acres compared to none in the other alternatives), it has the greatest potential to result in salvage opportunities, although it is only slightly higher than the 262,000 acres in Category C in Alternative B. Management actions to reduce fuels in the Wildland urban interface and restore historic fire regimes in forested types could also produce forest products.

Table 4-20 Alternative D – Decadal Forest Products Output	
Product	**Amount**
Dry Forest	7,300 to 18,200 acres of timber and 1,000 to 3,000 acres of small-diameter thin.
Cool Moist Forest	1,000 to 5,000 acres of timber and 400 to 1,200 acres of small-diameter thin.
New Permanent Road Construction	Kept to a minimum, some left open to public.
PSQ	10 to 30 MMBF
	36,000 to 107,000 CCF
Estimated Number of Permits Issued for Forest Products	600 Permits
Christmas Trees	9,000 Trees
Cords of Firewood	1,500 Cords
Small Timber Sales (Included with PSQ)	5,200 MBF
Post, Poles, Biomass, other woody materials	105 CCF
Timber Salvage	30 percent of affected area must be retained.

Effects from special status and priority species would generally be similar to Alternative B, except allowing no net increase in permanent roads in big game winter/calving range areas with low road density (defined as 0.5 mi/mi^2 or less in Alternative D) would affect fewer areas. Effects associated with limiting net increases in permanent roads in the grizzly bear distribution zone would be the same as under Alternative B.

Forest and woodland stands designated as ROS Semi-primitive non-motorized (18,029 acres) and Semi-primitive motorized (13,823 acres) under Alternative D amounts to 29 percent of the forest and woodland available for product removal in the Decision Area. Effects from area designations of ROS Semi-primitive classes would be similar to those described for Alternative B.

Very few forest and woodland stands were designated as VRM Class II under Alternative D (173 acres). This amounts to one tenth of one percent of the forest and woodland available for product removal in the Decision Area. There would be little, if any, effect on forest products and support of PSQ from area designations of VRM Class II, similar to effects under Alternative A.

In addition to the effects described under "Effects Common to All Alternatives" for the Sleeping Giant ACEC, vegetation management in the Humbug Spires ACEC (8,374 acres) could result in limited forest products although trying to meet primitive recreation goals would preclude removal of sawtimber or construction or roads for access, adversely affecting the economic viability of forest products projects. Vegetation management in the Elkhorns ACEC (3,575 acres) would not produce forest products due to the Wilderness Study Area designation.

Effects from ACEC management would be the same as under Alternative B.

Livestock Grazing

Effects Common to All Alternatives

There would be no effect from management of Lands and Realty-Land Use Authorizations, Energy and Minerals, Abandoned Mine Lands, Hazardous Materials Management, Environmental Justice or Tribal Treaty Rights.

Management actions to restore and improve riparian areas may require adjustments in grazing management such as adjusting numbers, rest, deferment, or maintaining existing livestock exclosures along streams, wetlands, and riparian areas in order to meet Proper Functioning Condition goals and the Western Montana Standards for Rangeland Health.

Maintaining or restoring the health and integrity of grasslands, sagebrush and shrublands, could change the amount of livestock grazing, or alter timing and utilization.

Wildland fire management activities (including prescribed fire and chemical and mechanical vegetation treatments) aimed at meeting or moving toward Land Health Standards would provide long-term benefits for vegetation and livestock by improving the forage base and availability.

Management actions to maintain cultural and paleontological resources may require adjustments in grazing management such as adjusting numbers, rest, deferment, or exclusion.

Effects of Alternative A

Treatment of grasslands to remove conifer encroachment would improve long-term forage quality and quantity. Some short-term but negligible effects would occur where deferment and temporary removal of livestock is required before and after vegetation treatments. Alterna-

tive A differs from the action alternatives in that the action alternatives would result in improved forage quantity and quality on shrublands in addition to grasslands.

Livestock grazing would be allowed on three percent more acres than Alternatives B and C and the same as Alternative D. (See **Table 4-21** for a summary of acres and AUMS by alternative.)

Alternative A would limit the tools available for improving land health in the Medicine Rock (Northeast Helena) riparian area by excluding prescription livestock grazing from availability in that area. Specifically, grazing of sheep or goats could not be used as a tool to treat weeds.

Management of noxious weeds would control and contain the proliferation of invasive weed species and would reduce established populations to acceptable levels, thereby maintaining long-term forage production, diversity, and vigor in the treatment areas. Livestock management flexibility would be reduced over the long-term in untreated areas because of the presence of invasive weeds and the reduction of usable forage. Alternative A would impact the amount of forage available the least, because noxious weed spread would be the least—43,000 acres (assuming implementation of the low end of the range of proposed weed treatment acres under the action alternatives).

Management actions such as designating open access to vehicles would increase recreational use, public awareness of livestock grazing, and access (that is, roads and gates). These travel management actions often result in conflicts with the livestock grazing program. Alternative A would leave more acres open to wheeled vehicles (4,367 acres or one percent of the Decision Area) and snowmobiles (144,750 acres or 49 percent of the Decision Area) than the action alternatives, which would designate 283 acres (0.1 percent of the Decision Area) open to wheeled vehicles and 140,033 acres (48 percent of the Decision Area) as open to snowmobiles. Therefore, compared to the other alternatives, management actions for travel management and actions under Alternative A would have the greatest potential for conflicts with livestock grazing.

Effects Common to Action Alternatives

In contrast to Alternative A, resource objectives on allotments without site-specific management objectives would be met, in part, by imposing grazing utilization level limits. On such allotments, the utilization level as measured at the end of the grazing season would not exceed 55 percent on non-native seedlings and 45 percent on native herbaceous forage plants, on a pasture average basis, except where lower use levels may be necessary to prevent detrimental effects on vegetation and other resources. Higher utilization objectives may be acceptable when set through an interdisciplinary planning or NEPA process to achieve resource objectives.

Compared to Alternative A, forage conditions on small allotments would be improved or maintained by prohibiting livestock conversions from sheep or cattle to horses on existing allotments smaller than 160 acres and horse permits or leases on available vacant parcels on all areas less than 160 acres. These restrictions would minimize overgrazing by horses on small allotments.

Prescription livestock grazing would be allowed as a management technique to maintain or improve habitat conditions for special status plant species and animal species.
Management of crucial and important wildlife habitat, especially on winter range, may require adjustments to livestock grazing.

Under the action alternatives, fewer acres of open access for vehicles would be designated than under Alternative A and conflicts with livestock grazing from these actions would be reduced. Alternative A would leave more acres open to wheeled vehicles (4,367 acres or 1 percent of the Decision Area) and snowmobiles (144,750 acres or 49 percent of the Decision Area) than the action alternatives, which would designate 283 acres (0.1 percent of the Decision Area) open to wheeled vehicles and 140,033 acres (48 percent of the Decision Area) as open to snowmobiles.

Effects of Alternative B

Treatment of grasslands and shrublands to improve desired ecological conditions would improve long-term livestock forage quality and quantity. Areas identified for prescribed burning would be rested from livestock grazing up to one year prior to treatment and treatment areas would be rested at a minimum of two full years following treatment resulting in short-term impacts on livestock grazing. Alternative B would treat three percent more acres of grasslands and shrublands (of Decision Area total) than Alternative C, one percent more

Table 4-21
Summary of Acres Available for Grazing by Alternative

	Alternatives			
	A	B	C	D
Acres available for grazing	278,000	270,000	262,000	278,000
Acres not available for grazing	29,000	37,000	45,000	29,000
Permitted AUMs	25,677	24,710	24,710	25,677
Forage reserve, temporary non-renewable AUMs	0	1,312	936	0

than Alternative A and two percent fewer than Alternative D.

Livestock grazing would be allowed on three percent fewer public land acres than Alternatives A and D, and one percent more than Alternative C. (See **Table 4-21** for a summary of acres and AUMS by alternative.)

More acres would be managed as forage reserve than under any of the other alternatives. Forage reserve allotments (1,312 AUMs) would be managed to meet, or move toward meeting, Land Health Standards. Forage reserve allotments would provide opportunities for qualified applicants to rest allotments when required and would facilitate management actions or relieve resource problems. Management as forage reserve, as opposed to normally permitted allotments, is more costly to administer. Thus, the cost of administering forage reserves would increase the most when compared to the other alternatives. However, the number of AUMs managed as forage reserve is small (five percent) relative to the total number of AUMs under Alternative B, so the impact would be minor.

Alternative B would allow for greater flexibility, compared to Alternatives A and C, in the tools available for improving land health in the Centennial Gulch (Ward Ranch) allotment and the Medicine Rock (Northeast Helena) riparian area by allowing prescription livestock grazing in those areas.

The impacts from management of noxious weeds would be similar to those discussed under Alternative A; however the amount of noxious weed spread could be higher under this alternative—48,000 acres—than under Alternative A, thus reducing the amount of forage available (assuming implementation of the low end of the range of proposed weed treatment acres for Alternative B).

Fence modification costs to remove or reconstruct fences identified as wildlife barriers would be less than Alternative C, but more than D because the alternative B prescription has some flexibility.

Effects of Alternative C

Compared to the other alternatives, management action in grasslands and shrublands in Alternative C would improve long-term livestock forage quality and quantity the least. Alternative C would treat two percent fewer acres than Alternative A (at Decision Area scale), three percent fewer than Alternative B and five percent fewer than Alternative D.

Six percent fewer public land acres would be available for livestock grazing than Alternatives A and D and 3 percent fewer than Alternative B (See **Table 4-21** for a summary of acres and AUMS by alternative.) Managing the McMaster Hills and Spokane Hills allotments as forage reserve allotments, as described under Alternative B, would increase the costs to administer those lands.

Alternative C would limit the tools available for improving land health in the Centennial Gulch (Ward Ranch) allotment and Medicine Rock (Northeast Helena) riparian area by excluding prescription livestock grazing from availability in those areas.

The impacts from management of noxious weeds would be similar to those previously discussed except the impacts to the livestock forage base could be highest because the amount of noxious weed spread would be highest under this alternative (assuming implementation of the low end of the range of proposed weed treatment acres for Alternative C).

Fence reconstruction costs to remove and replace fences identified as barriers to wildlife movement would be highest under this alternative because of the stringent management mandate.

Effects of Alternative D

Compared to the other alternatives, management of grasslands and shrublands in Alternative D would result in the greatest improvement in long-term livestock forage quality and quantity from vegetation treatments on grasslands and shrublands. Alternative D would treat two percent more acres than Alternative B (at the Decision Area scale), three percent more than Alternative A, and five percent more than Alternative C.

Livestock grazing on public land would be allowed on the same amount of acres as Alternative A, two percent more than Alternative B, and three percent greater than Alternative C. (See **Table 4-21** for a summary of acres and AUMS by alternative.)

Compared to the other alternatives, noxious weed management in Alternative D could result in 47,000 acres of spread (assuming implementation of the low end of the range of proposed weed treatment acres for the action alternatives). Consequently more livestock forage could be maintained than under Alternatives B and C, but less than under Alternative A.

As with Alternative A, under Alternative D, the existing Instruction Memorandum 98-140 (1998) would be followed which would impose restrictions on new goat and sheep allotments as well as those allotments with conversions from cattle to sheep and goats in order to minimize physical contact between domestic and wild sheep.

Fences identified as barriers to wildlife movement would be considered for removal or reconstruction on a case by case basis, to follow BLM fence specifications for wildlife.

Designation of two new ACECs totaling 11,949 acres would require management activities to protect or enhance ACEC values. Management activities may include restrictions on livestock grazing, requirements to maintain/build boundary fences and cattle guards, and closely monitor livestock trailing.

ENERGY AND MINERALS

Effects Common to All Alternatives

Energy and Minerals

Approximately 6,300 acres would remain withdrawn or not available for mineral entry (leasable, locatable, and salable). Approximately 6,000 acres along the Missouri River Chain of Lakes would continue to be withdrawn in Power Site Reserve and Power Project withdrawals. The effect on mineral leasing would be negligible as the area represented is small and in scattered small parcels when compared with the overall area available to leasing in the Planning Area.

Leasable Solid Minerals

There are no known potentially economic deposits of leasable solid minerals such as sodium, potash, sulphur, oil shale, native asphalt, and solid and semi-solid bituminous rock in the Planning Area. If any were discovered on lands administered by the federal government, the decision to lease them would be made by the BLM on a case-by-case basis.

Leasable Geothermal Resources

Geothermal resource leasing activity is not anticipated, so there would be no effects.

Leasable Fluid Minerals

Stipulations applied to various areas with respect to occupancy, timing limitation, and control of surface use would have the greatest effects on oil and gas exploration and development. Some areas would be deemed unavailable for oil and gas leasing as a result of existing non-discretionary closures for Wilderness Study Areas. Others may be determined unavailable as a result of the discretionary decisions of this RMP. These lease stipulations and the availability of the federal mineral estate for fluid mineral leasing varies by alternative.

No Surface Occupancy stipulations may decrease some lease values, increase operating costs, and to a lesser extent (given the RFD) require relocation of well sites and modification of field development. Leases issued with moderate constraints (Timing Limitation and Controlled Surface Use stipulations) may result in similar impacts, and delays in operations and uncertainty on the part of operators regarding restrictions.

Locatable Minerals

Because the Planning Area is considered to be highly prospective for base and precious metal deposits, it is likely that there would be multiple applicants for exploration and that one or more mining companies would submit a proposed Plan of Operations to develop a new large scale metal mine at some point in the next 20 years.

Mineral exploration activities would include construction of exploration drill roads, drilling pads, and equipment staging areas. Activities would be conducted under a notice or an approved Plan of Operations and require bonding for reclamation and closure.

Large-scale mines, mine expansions, and small-scale mining operations are likely to result in disturbances from access road construction, increased traffic, surface disturbance (i.e. underground portals; mine pits; waste rock dumps; ore processing, tailing facilities, administration and maintenance facilities; and storm water run-off control ponds and diversions structures). Virtually all mineral activity also requires state permits.

Placer operations would affect streambeds or terrace deposits adjacent to streams, by excavating and processing sand and gravel deposits for the recovery of gold. These operations would have mitigation measures in place to protect riparian areas and other natural resources. Site reclamation work would be bonded by the BLM and the state to insure completion of reclamation following mining.

BLM anticipates that there would be four to ten placer mining operations per year on Decision Area lands, with the actual number depending on the price of gold.

BLM would develop and implement measures to prevent unnecessary or undue degradation from exploration, mining, and reclamation activities. In some areas, such as ACECs, these requirements could result in additional expenditures to protect resources and prevent unnecessary or undue degradation.

BLM or other agency authorization of rights-of-way for facilities such as roads, highways, and power lines could provide access and infrastructure for exploration of locatable minerals and mining operations. Alternatively, denial of rights-of-way could result in negative impacts on operations.

Land ownership changes could result in acquisition or disposal of lands with mineral value, and either increase or decrease opportunities for mineral development. Acquisition of legal access across private or other lands could result in increased opportunities to explore and develop areas not accessible by another route.

The following 31,349 acres of land in the Decision Area are currently WSAs:

- Sleeping Giant (6,666 acres),
- Sheep Creek (3,801 acres),
- Elkhorn's Tack-on (3,575 acres),
- Black Sage (5,917 acres),
- Humbug Spires (11,320 acres), and
- Yellowstone Island (69 acres)

These lands are managed under the Interim Management Policy (H-8550-1) and mineral development activities

are thus restricted. Once a final Congressional determination is made on wilderness consideration, these lands would either become wilderness areas or be released and managed according to this plan.

An approved Plan of Operations is required in designated ACECs for all surface disturbing activities exceeding the casual use level. Activities which could normally proceed after the filing of a Notice would require an approved Plan of Operations in an ACEC. The increased environmental review, mandatory public comment period, and application of management prescriptions needed to protect ACEC-values, would result in timing delays or increased costs for mineral operators.

Fire management activities could temporarily result in restricted access to a mining project during implementation of prescribed burning, or during wildland fire suppression.

Rehabilitation and closure of abandoned mine land sites and associated features would result in the removal or obscuring of information contained in waste dumps, excavations, adits, and shafts used by exploration companies to sample and map mineral deposits.

Salable Minerals

Extraction of salable material by excavation or mining would result in a mine or quarried pit. Effects from access roads and pit construction would be minor or moderate depending on the scale of the quarrying operations (size and ability to reclaim the ultimate pit). Existing requirements for topsoil salvage and reclamation would minimize impacts from mining.

Stipulated requirements and BMPs designed to avoid or minimize adverse effects on riparian zones from structures, support facilities, and roads could result in additional expenditures and a longer approval time for the developer. BLM's discretionary sale approval policy could avoid sale of materials from riparian areas.

Mitigation measures to eliminate or reduce impacts resulting from exploration or mining operations could also result in additional expenditures and a longer permitting timeframe for the developer.

BLM or other agency authorization of rights-of-way for facilities such as roads, highways, and power lines could provide access and infrastructure. Alternatively, denial of rights-of-way could negatively affect operations.

Effects of Alternative A

Energy and Minerals

Approximately 287,457 acres of BLM lands would be available for locatable mineral entry and consideration for other mineral disposals. Energy and minerals permits would allow for development of the mineral resources to provide for the resource needs of society.

Leasable Fluid Minerals

Continuation of current management would result in the availability of approximately 597,384 acres for fluid mineral leasing across the entire Planning Area. Approximately eight percent (54,810 acres) of BLM subsurface ownership would be unavailable (**Table 4-22**), including Sleeping Giant, Sheep Creek, Elkhorn's Tack-on, Black Sage, Humbug Spires, and Yellowstone Island WSAs.

Other areas unavailable for oil and gas leasing would include core areas of state wildlife management areas and lands recently acquired with LWCF funds. The remainder of federal mineral estate lands would be available for leasing, subject to the stipulations specified in Chapter 2 or under Standard Lease Terms.

Table 4-23 displays areas affected by no surface occupancy, timing limitations, and controlled surface use oil and gas stipulations.
The RFD scenario prepared for this RMP identified five areas in the Planning Area where it was the most reasonable to forecast conventional oil and gas or coal bed methane exploration and development based on existing information. These areas are described and defined in both Chapter 3 and **Appendix M**. The total Federal mineral estate in these five areas is approximately 116,295 acres.

Table 4-22
Alternative A – Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing

Classification	Acres
No Surface Occupancy[1]	251,779
Timing Limitations[1]	285,993
Controlled Surface Use[1]	27,701
Standard Lease Terms[1]	31,911
Acres Available for Oil and Gas Leasing	**597,384**
Non-discretionary (unavailable)	28,774
Discretionary (unavailable)	26,036
Acres Unavailable for Oil and Gas Leasing	**54,810**

[1]Acreages by stipulation subcategory were calculated such that the subcategories add up to the total available acres for leasing based on the following general concepts where multiple stipulations overlapped: No Surface Occupancy stipulations override and are more restrictive than Timing Limitations, Controlled Surface Use, and Standard Lease Terms. Timing Limitation stipulations override and are more restrictive than Controlled Surface Use and Standard Lease Terms. Controlled Surface Use stipulations override and are more restrictive than Standard Lease Terms. Non-overlapping individual stipulation-specific acreages are displayed by alternative in Tables 4-23, 4-27, 4-30, and 4-33.

Table 4-23
Alternative A Acres Affected by Oil and Gas Stipulations

Type of Stipulation	Stipulation	Development Potential			Total Acres Stipulated[1]
		Moderate	Low	Very Low	
No Surface Occupancy					
Arctic Grayling Habitat	NSO ¼	202	10,459	2,694	13,355
Bald Eagle Nest Sites	NSO ½	1,089	1,068	419	2,576
Class 1 Fisheries	NSO 1000	1,012	6,876	2,139	10,027
Continental Divide Trail	NSO 300	0	0	180	180
Developed Recreation Sites	NSO 300	12	61	134	208
Ferruginous Hawk Breeding Territories[2]	NSO ¼	0	0	0	0
Known Special Status Plant Populations	NSO ¼	783	2,705	4,183	7,671
National Register of Historic Places Eligible	NSO 300	74	143	1,438	1,654
Peregrine Falcon Nest Sites/Breeding Habitat	NSO ¼	39	88	117	244
Prairie Dog Towns[2]	NSO ¼	0	0	0	0
Raptor Breeding Territories	NSO ¼	639	749	856	2,245
Rivers Suitable for WSR Designation	NSO 1000	276	522	1,584	2,382
Sage Grouse Strutting Grounds (leks)[2]	NSO 500	0	0	0	0
Westslope Cutthroat Habitat (90-99%)	NSO ¼	0	62	765	827
Westslope Cutthroat Habitat (99-100%)	NSO ¼	27	2,087	2,741	4,855
Wetlands, Floodplains and Riparian Areas	NSO 500, 1000	39,395	88,753	101,151	229,299
Wildlife Management Areas	NSO	2,971	34,971	28,050	65,992
Yellowstone Cutthroat Trout Habitat	NSO ¼	256	1,668	683	2,607
Timing Limitations					
Bald Eagle Breeding Habitat	TL 12/1 - 8/31	4,179	4,129	1,230	9,538
Big Game Winter/Spring Range	TL 12/1 - 5/15	102,198	187,180	209,595	498,973
Bighorn Sheep Core Areas	TL 12/1 - 5/15	24,012	13,781	32,822	70,615
Bighorn Sheep Yearlong Range	TL 12/1 - 5/15	30,109	26,067	75,103	131,279
Elk Calving/Big Game Birthing Areas	TL 5/1 - 6/30	1,150	8,033	11,124	20,307
Sage Grouse Breeding Habitat	TL 3/1 – 6/30 ½	0	0	0	0
Sage Grouse Winter/Spring Range	TL 12/1 - 5/15	538	46,768	19,517	66,824
Controlled Surface Use					
Controlled Surface Use stipulations for TES Species, Cultural and Paleontological Resource Inventory, and Special Status Plant Habitats would apply across the entire Decision Area so acreages were not calculated separately.					
Bull Trout Habitat	CSU ½	26	1,210	2,758	3,994
Gray Wolf Dens – Former Recovery Area	CSU	14,142	8,487	72,071	94,700
Grizzly Bear – Distribution Zone	CSU	34	29,008	24,905	53,947
Grizzly Bear – Recovery Zone	CSU	0	1,651	5,731	7,382
Restricted Soils	CSU	40,927	78,990	129,220	249,137
VRM Class II, III and IV Areas	CSU	65,962	77,938	104,949	248,849

[1]Total acres affected by each stipulation are based on individual, independent, stipulation-specific GIS mapping and have not been overlapped with any other stipulations. Figures are provided here to display which stipulations for which resources are relatively dominant in the Decision Area.

[2]Total values of "0" indicate that there are currently no known sites or acres associated with this particular resource. Stipulation would apply to any newly detected sites or acres in the future.

An analysis was completed for each alternative to review the impact of constraints in the form of oil and gas lease stipulations imposed on oil and gas exploration and development within the boundaries of these five areas based on the belief that this would further quantify the effects of management under the various alternatives as these are the areas that the BLM believes have the most potential (low to moderate potential overall) for exploration and development (see **Table 4-24**).

Table 4-24
Alternative A – Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing in Potential Development Areas

Classification	Acres
No Lease	**9,849**
No Surface Occupancy	43,136
Timing Limitation	53,649
Controlled Surface Use	1,638
Standard Lease Terms	8,024
Total Available for Oil and Gas Leasing	**106,447**

Under Alternative A the analysis shows that approximately 8.5 percent of these five areas would not be available for oil and gas leasing. Approximately 37 percent of the areas would be subject to leasing subject to major constraints (no surface occupancy). Approximately 48 percent would be leased subject to moderate constraints. Approximately seven percent would be leased subject to standard terms and conditions. Alternative A is similar in its level of constraints to Alternative B. Both subject approximately 35 to 37 percent of the federal minerals to major constraints and approximately 48 to 55 percent to moderate constraints. Due to the level of major constraints, Alternatives A and B are somewhat more restrictive than Alternative D but much less restrictive than Alternative C.

Locatable Minerals

Locatable minerals activities would be regulated to prevent unnecessary or undue degradation as required by regulations (43 CFR 3809). Under Alternative A, 239,138 acres would remain open to mineral entry and consideration for salable mineral disposals without restrictions, 48,319 would be open to mineral entry with restrictions and 17,522 acres would be closed (**Table 4-25**).

Salable Minerals

Access roads and mine development for salable minerals would usually be located near municipalities or small rural communities. Impacts on natural resources and local residents would be avoided where possible or mitigated.

Table 4-25
Locatable Mineral Analysis of Federal Surface Mineral Estate
(May include a small area administered by the BOR)

Mineral Potential	Restricted Acres	Closed Acres	Open Acres	Totals
Alternative A				
High	11,344	3,675	103,541	118,560
Medium	6,495	3952	24,505	34,952
Low-None	30,479	9,894	111,092	151,466
Totals	48,319	17,522	239,138	304,978
Alternative B				
High	37,495	3,675	77,390	118,560
Medium	9,586	3,952	21,414	34,952
Low-None	41,647	9,919	99,899	151,466
Totals	88,728	17,547	198,704	304,978
Alternative C				
High	43,456	3,746	71,359	118,560
Medium	13,527	3,952	17,473	34,952
Low-None	54,248	10,022	87,196	151,466
Totals	111,230	17,720	176,028	304,978
Alternative D				
High	11,344	3,675	103,541	118,560
Medium	6,495	3,952	24,505	34,952
Low-None	29,768	9,849	111,804	151,466
Totals	47,607	17,522	239,850	304,978

Acreage analyzed excludes approximately 2,300 acres not covered by the MBMG Mineral Potential reviews and about 347,000 acres of federal subsurface minerals.

Restricted Areas include WSAs, ACECs, WSRs, and T&E habitat (grizzly bear, bald eagle, and bull trout).

Closed areas include Withdrawals, proposed withdrawals, and LWCF Lands (11,246 acres), Lands in Public Water Reserves, Power site Reserves, Protective withdrawals and WCF lands are static and do not change from one alternative to another).

Open areas are all other areas.

Travel Plan road designations not included in analysis.

Effects of Alternative B

Energy and Minerals

Approximately 287,456 acres of BLM lands would be available for locatable mineral entry and consideration or other mineral disposals. Energy and minerals permits would allow for development of the mineral resources to provide for the resource needs of society. Additional lands would be available from core areas of state wildlife management areas for oil and gas leasing compared to Alternative A.

Approximately 623,420 acres would be available for fluid mineral leasing under Alternative B. Four percent (approximately 28,774 acres) of BLM-administered federal mineral estate lands would not be available for oil and gas leasing (**Table 4-26**) including WSAs. The remainder of federal mineral estate lands in the Planning Area would be available for leasing, subject to the stipulations specified in Chapter 2 or to Standard Lease Terms.

Table 4-27 displays acres affected by no surface occupancy, timing limitations, and controlled surface use oil and gas stipulations. Additional lands would be available from core areas of state wildlife management areas (about 20,200 acres) for oil and gas leasing compared to Alternative A. The effects would be similar to Alternative A with respect to overall percent of acres available for leasing, 92 percent for Alternative A, and 94 percent for Alternative B.

Table 4-26
Alternative B – Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing

Classification	Acres
No Surface Occupancy[1]	280,312
Timing Limitations[1]	286,800
Controlled Surface Use[1]	38,365
Standard Lease Terms[1]	17,943
Acres Available for Oil and Gas Leasing	**623,420**
Non-discretionary (unavailable)	28,774
Discretionary (unavailable)	0
Acres Unavailable for Oil and Gas Leasing	**28,774**

[1]Acreages by stipulation subcategory were calculated such that the subcategories add up to the total available acres for leasing based on the following general concepts where multiple stipulations overlapped: No Surface Occupancy stipulations override and are more restrictive than Timing Limitations, Controlled Surface Use, and Standard Lease Terms. Timing Limitation stipulations override and are more restrictive than Controlled Surface Use and Standard Lease Terms. Controlled Surface Use stipulations override and are more restrictive than Standard Lease Terms. Non-overlapping individual stipulation-specific acreages are displayed by alternative in Tables 4-23, 4-27, 4-30, and 4-33.

Table 4-27
Alternative B Acres Affected by Oil and Gas Stipulations

Type of Stipulation	Stipulation	Development Potential			Total Acres Stipulated[1]
		Moderate	Low	Very Low	
No Surface Occupancy					
Bald Eagle Nest Sites	NSO ½	1,089	1,068	419	2,576
Bighorn Sheep Core Areas	NSO	24,012	13,781	32,822	70,615
Bull Trout Habitat	NSO ½	26	1,210	2,758	3,994
Class 1 Fisheries (Blue Ribbon)	NSO ½	3,300	20,297	6,874	30,470
Continental Divide Nat'l Scenic Trail (Marysville)	NSO ½	0	0	1,574	1,574
Developed Recreation Sites	NSO ¼	207	981	1,877	3,064
Ferruginous Hawk Breeding Territories	NSO ½	0	0	0	0
Fluvial/Adfluvial Arctic Grayling Habitat	NSO ½	390	20,944	6,068	27,401
Grizzly Bear – Recovery Zone	NSO	0	1,651	5,731	7,382
Known or Discovered Special Status Plants or Populations	NSO ¼	784	2,705	4,183	7,671
Lewis & Clark National Historic Trail	NSO ½	4,671	4,547	2,610	11,828
Municipal Watersheds	NSO	13,083	86,169	47,224	146,477
National Register of Historic Places Eligible Properties/Districts and Paleontological Localities	NSO 300	74	143	1,438	1,654
Peregrine Falcon Nest Sites/Breeding Habitat	NSO 1	579	1,744	1,485	3,808

Table 4-27
Alternative B Acres Affected by Oil and Gas Stipulations

Type of Stipulation	Stipulation	Development Potential			Total Acres Stipulated[1]
		Moderate	Low	Very Low	
Prairie Dog Towns[2]	NSO	0	0	0	0
R&PPs and 2920 Authorizations	NSO	0	0	816	816
Rivers Suitable for WSR Designation	NSO ½	928	62	1,525	2,515
Sage Grouse Strutting Grounds (leks)[2]	NSO ¼	0	0	0	0
Traditional Cultural Properties[2]	NSO ½	0	0	0	0
Westslope Cutthroat Trout Habitat (90-99% pure)	NSO ½	0	255	1,939	2,194
Westslope Cutthroat Trout Habitat (99-100% pure)	NSO ½	84	4,775	6,099	10,958
Streams with High Restoration Potential – Native Fish[2]	NSO ½	0	0	0	0
Wetlands, Floodplains and Riparian Areas	NSO	1,965	4,522	4,959	11,445
Wildlife Management Areas	NSO	2,971	34,971	28,050	65,992
Yellowstone Cutthroat Trout Habitat	NSO ½	599	5,050	1,462	7,111
Lands Acquired with LWCF funds	NSO	2,718	3,652	1,308	7,677
Timing Limitations					
Bald Eagle Breeding Habitat	TL 2/1-8/31 1	4,179	4,129	1,230	9,538
Big Game Winter/Spring Range	TL 12/1-5/15	102,198	187,180	209,595	498,973
Bighorn Sheep Yearlong Range	TL 11/1-6/30	30,109	26,067	75,103	131,279
Elk Calving/Big Game Birthing Areas	TL 4/1-6/30	1,150	8,033	11,124	20,307
Gray Wolf Dens – Former NW MT Recovery Area	TL 4/15-6/30 1	0	0	698	698
Grizzly Bear – Denning Habitat (Distribution Zone)	TL 4/1-6/30, 9/15-10/15	34	29,008	24,905	53,947
Raptor Breeding Territories (Golden eagle, Prairie falcon, Swainson's Hawk)	TL 3/1-7/31 ½	2,108	2,528	2,782	7,419
Sage Grouse Breeding Habitat	TL 3/1-6/30 3	0	2,751	0	2,751
Sage Grouse Winter/Spring Range	TL 12/1-5/15	538	46,768	19,517	66,824
Controlled Surface Use					
Controlled Surface Use stipulations for TES Species, Cultural and Paleontological Resource Inventory, and Special Status Plant Habitats would apply across the entire Decision Area so acreages were not calculated separately.					
Soils are either areas of mass wasting, unstable land areas; Non-Boulder Batholith with Slopes >30%; or Boulder Batholith with slopes >20%	CSU	40,927	78,990	129,220	249,137
Special Recreation Management Areas	CSU	15,965	47,439	34,657	98,061
VRM Class II, III & IV Areas	CSU	65,962	77,938	104,949	248,849

[1]Total acres affected by each stipulation are based on individual, independent, stipulation-specific GIS mapping and have not been overlapped with any other stipulations. Figures are provided here to display which stipulations for which resources are relatively dominant in the Decision Area.

[2]Total values of "0" indicate that there are currently no known sites or acres associated with this particular resource. Stipulation would apply to any newly detected sites or acres in the future.

Leasable Minerals

The timing limitation stipulation for sage grouse breeding habitats would be applied to 2,751 acres of the Decision Area, with limitations on surface access restricted seasonally for geophysical, drilling, and field development activities from March 1 to June 30 added to the total acres affected by Alternative B compared to Alternative A.

An analysis of the five areas in the Planning Area considered to be the most prospective for oil and gas explora-

tion and development was completed for Alternative B. Under this alternative, approximately six percent of these areas would not be available for oil and gas leasing. Approximately 35 percent of the areas would be subject to leasing, subject to major constraints (no surface occupancy). Approximately 55 percent could be leased, subject to moderate constraints. Approximately 1.4 percent could be leased, subject to standard terms and conditions. Alternative B is similar in its level of constraints to Alternative A (**Table 4-28**).

Table 4-28
Alternative B – Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing in Potential Development Areas

Classification	Acres
No Lease	9,821
No Surface Occupancy	41,115
Timing Limitation	59,498
Controlled Surface Use	4,182
Standard Lease Terms	1,678
Total Available for Oil and Gas Leasing	**106,474**

Locatable Minerals

Approximately 198 acres would be recommended for withdrawal from mineral entry in developed recreation sites. These acres would not be open to future mineral entry.

Under Alternative B, 287,431 acres of federal surface/minerals would remain open to mineral entry and consideration for salable mineral disposals. A total of 47,081 acres of moderate and high potential would be restricted (**Table 4-25**). Alternative B would have more impact on access to mineralized areas than Alternatives A and D, but less than Alternative C. Impacts to areas with low mineral potential would not be substantial to mineral production.

Effects of Alternative C

Energy and Minerals

Like in Alternative B, approximately 287,258 acres of BLM lands would be available for locatable mineral entry and consideration for other mineral disposals under Alternative C. Approximately 56,982 acres of high and medium potential would be restricted under this alternative (**Table 4-25**).

Alternative C could result in additional expenditures for the mineral developer and, in some cases, could affect the ability to proceed with a project should access to water or the streambed be a critical part of the proposed operations. Existing roads and facilities would be closed and the landscape and rehabilitated when no longer required for mineral or land management activities.

Leasable Minerals

Under Alternative C, 89 percent (580,382 acres) of the Decision Area would not be available for oil and gas leasing (**Table 4-29**).

Table 4-29
Alternative C Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing

Classification	Acres
No Surface Occupancy[1]	23,903
Timing Limitations[1]	0
Controlled Surface Use[1]	30,893
Standard Lease Terms[1]	17,016
Acres Available for Oil and Gas Leasing	**71,812**
Non-discretionary (unavailable)	28,774
Discretionary (unavailable)	551,608
Acres Unavailable for Oil and Gas Leasing	**580,382**

[1]Acreages by stipulation subcategory were calculated such that the subcategories add up to the total available acres for leasing based on the following general concepts where multiple stipulations overlapped: No Surface Occupancy stipulations override and are more restrictive than Timing Limitations, Controlled Surface Use, and Standard Lease Terms. Timing Limitation stipulations override and are more restrictive than Controlled Surface Use and Standard Lease Terms. Controlled Surface Use stipulations override and are more restrictive than Standard Lease Terms. Non-overlapping individual stipulation-specific acreages are displayed by alternative in Tables 4-23, 4-27, 4-30, and 4-33.

This includes the Wilderness Study Areas identified in Alternative B, plus lands in these additional locations:

- Prairie Dog Towns
- Sage Grouse Winter/Spring Range
- Lands within 0.5 miles of Sage Grouse Strutting Grounds (leks)
- State Wildlife Management Areas
- Big Game Winter/Spring Range Elk Calving/Big Game Birthing Areas
- Bighorn Sheep Yearlong habitat
- Lands within 1 mile of Bald Eagle Nesting/Breeding areas
- Lands within 0.5 mile of Raptor Breeding Areas
- Lands within 1 mile of peregrine falcon breeding territories
- Lands within 0.5 mile of Raptor Breeding Areas
- Lands within 1 mile of peregrine falcon breeding territories
- Lands within 0.5 mile of ferruginous hawk breeding territories

- Lands within 1 mile of 99 to 100 percent pure westslope cutthroat trout habitats
- Yellowstone Cutthroat Habitat
- Municipal Watersheds
- Lands recently acquired with LWCF funds.

The remainder of mineral estate in the Planning Area (71,812 acres) would be available for leasing, subject to the stipulations specified in Chapter 2 or to Standard Lease Terms.

Table 4-30 displays acres affected by no surface occupancy, timing limitations, and controlled surface use oil and gas stipulations. Alternative C would eliminate most of the Decision Area for oil and gas leasing activity, deny access for oil and gas exploration on most Decision Area lands, and greatly reduce the area available for the potential discovery and development of new oil and gas resources.

Table 4-30
Alternative C Acres Affected by Oil and Gas Stipulations

Type of Stipulation	Stipulation	Development Potential			Total Acres Stipulated[1]
		Moderate	Low	Very Low	
No Surface Occupancy					
Bull Trout Habitat	NSO 1	414	3,641	5,121	9,175
Class 1 Fisheries (Blue Ribbon)	NSO 1	8,287	40,242	13,362	61,892
Continental Divide National Scenic Trail (Marysville)	NSO ½	0	0	1,574	1,574
Developed Recreation Sites	NSO ½	975	3,740	6,081	10,796
Fluvial/Adfluvial Arctic Grayling Habitat	NSO ½	390	20,944	6,068	27,401
Gray Wolf Dens – Former NW MT Recovery Area	NSO 1	0	0	698	698
Grizzly Bear – Denning Habitat (Distribution Zone)	NSO	34	29,008	24,905	53,947
Grizzly Bear – Recovery Zone	NSO	0	1,651	5,731	7,382
Known or Discovered Special Status Plants or Populations	NSO ½	1,953	5,856	9,092	16,902
Lewis & Clark National Historic Trail	NSO 1	10,336	10,223	4,510	25,070
National Register of Historic Places Eligible Properties/ Districts and Paleontological Localities	NSO 300	74	143	1,438	1,654
R&PPs and 2920 Authorizations	NSO	0	0	816	816
Rivers Suitable for WSR Designation	NSO 1	2,175	3,721	8,530	14,426
Sage Grouse Breeding Habitat	NSO 3	0	2,751	0	2,751
Special Recreation Management Areas	NSO	15,965	47,439	34,657	98,061
Traditional Cultural Properties[2]	NSO ½	0	0	0	0
Westslope Cutthroat Trout Habitat (90-99% pure)	NSO ½	0	255	1,939	2,194
Wetlands, Floodplains and Riparian Areas	NSO	1,965	4,522	4,959	11,445
Timing Limitations					
Ferruginous Hawk Breeding Territories[2]	NL ½ + TL 3/1-8/31 1	0	0	0	0
Controlled Surface Use					
Controlled Surface Use stipulations for TES Species, Cultural and Paleontological Resource Inventory, and Special Status Plant Habitats would apply across the entire Decision Area so acreages were not calculated separately.					
Soils are either areas of mass wasting, unstable land areas; Non-Boulder Batholith with Slopes >30%; or Boulder Batholith with slopes >20%	CSU	40,927	78,990	129,220	249,137
VRM Class II, III & IV Areas	CSU	63,231	77,938	104,949	246,118

[1]Total acres affected by each stipulation are based on individual, independent, stipulation-specific GIS mapping and have not been overlapped with any other stipulations. Figures are provided here to display which stipulations for which resources are relatively dominant in the Decision Area.

[2]Total values of "0" indicate that there are currently no known sites or acres associated with this particular resource. Stipulation would apply to any newly detected sites or acres.

An analysis of the five areas in the Planning Area considered to be the most prospective for oil and gas exploration and development was completed for Alternative C. Under this alternative approximately 93 percent of these areas would not be available oil and gas leasing (**Table 4-31**).

Table 4-31
Alternative C Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing in Potential Development Areas

Classification	Acres
No Lease	108,784
No Surface Occupancy	2,185
Timing Limitation	0
Controlled Surface Use	3,898
Standard Lease Terms	1,428
Total Available for Oil and Gas Leasing	7,511

Approximately two percent of the areas would be leasable, subject to major constraints (no surface occupancy). Approximately three percent would be leased subject to moderate constraints. Approximately two percent would be leased subject to standard terms and conditions. Based on this level of constraints it can be assumed that it is not reasonable to foresee any federal oil and gas development under this alternative.

Locatable Minerals

Effects to area availability for locatable mineral operations would be slightly greater than under Alternative B, with an additional 9,901 acres of high and medium potential lands being restricted. Impacts to areas with low mineral potential would not be substantial to mineral production.

Salable Minerals

The BLM would not allow the purchase of salable minerals (common varieties of sand, stone, gravel, pumice, cinders, clay and petrified wood), unless desired by the state or counties, or within existing community pits.

Alternative C would have the same effects on mining as Alternative A; however, Alternative C would eliminate private citizens and municipal applications for new sites because county and state governments would be the agencies that have to initiate the request. Private citizens and municipalities would have to purchase their mineral materials from commercial sources and pay higher costs for transportation.

Effects of Alternative D

Energy and Minerals

Like in Alternative A, approximately 287,456 acres of BLM lands would be available for locatable mineral entry and consideration for other mineral disposals (**Table 4-25**).

Roads could be built in riparian areas, however, avoidance, mitigations, and BMPs would result in effects being the same as Alternatives A and B. Roads and facilities no longer required for mineral, or land management activities would be reclaimed to the extent possible.

Leasable Minerals

Under Alternative D approximately 615,788 acres would be available for fluid mineral leasing. Six percent (36,406 acres) of federal mineral estate lands would not be available for oil and gas leasing, including the Wilderness Study Areas and lands recently acquired with LWCF funds (**Table 4-32**).

Table 4-32
Alternative D Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing

Classification	Acres
No Surface Occupancy[1]	93,288
Timing Limitations[1]	436,410
Controlled Surface Use[1]	32,011
Standard Lease Terms[1]	54,079
Acres Available for Oil and Gas Leasing	615,788
Non-discretionary (unavailable)	28,774
Discretionary (unavailable)	7,632
Acres Unavailable for Oil and Gas Leasing	36,406

[1]Acreages by stipulation subcategory were calculated such that the subcategories add up to the total available acres for leasing based on the following general concepts where multiple stipulations overlapped: No Surface Occupancy stipulations override and are more restrictive than Timing Limitations, Controlled Surface Use, and Standard Lease Terms. Timing Limitation stipulations override and are more restrictive than Controlled Surface Use and Standard Lease Terms. Controlled Surface Use stipulations override and are more restrictive than Standard Lease Terms. Non-overlapping individual stipulation-specific acreages are displayed by alternative in Tables 4-23, 4-27, 4-30, and 4-33.

The remainder of mineral estate in the Decision Area would be available for leasing, subject to the stipulations specified in Chapter 2 or to Standard Lease Terms.

Effects would be similar to Alternative B with respect to overall acres of BLM administered land available for leasing and not available for leasing (compare **Table 4-26** and Table 4-33). However, Alternative D would apply the same stipulations to different acres. For example, there are fewer acres of land under No Surface Occupancy and Controlled Surface Use stipulations and a much larger number of acres under Timing Limitations and Standard Lease Terms stipulations under Alternative D, than Alternative A (**Table 4-22** and **Table 4-33**). As a result Alternative D would be less stringent in the application of stipulations for leasing of essentially the same amount of land as Alternative A. The amount of

actual land disturbance from these less stringent leasing stipulations should be relatively minor because the amount of drilling would be driven by exploration potential, which is generally low throughout federal mineral estate lands.

Table 4-33 displays acres affected by no surface occupancy, timing limitations, and controlled surface use oil and gas stipulations under Alternative D.

Table 4-33
Alternative D Acres Affected by Oil and Gas Stipulations

Type of Stipulation	Stipulation	Development Potential			Total Acres Stipulated[1]
		Moderate	Low	Very Low	
No Surface Occupancy					
Bald Eagle Nest Sites	NSO ½	1,089	1,068	419	2,576
Bull Trout Habitat	NSO ½	26	1,210	2,758	3,994
Known or Discovered Special Status Plants or Populations	NSO	54	672	299	1,025
National Register of Historic Places Eligible Properties/ Districts and Paleontological Localities	NSO 300	74	143	1,438	1,654
Peregrine Falcon Nest Sites/Breeding Habitat	NSO 1	579	1,744	1,485	3,808
Prairie Dog Towns[2]	NSO	0	0	0	0
R&PPs and 2920 Authorizations	NSO	0	0	816	816
Sage Grouse Strutting Grounds (leks)[2]	NSO ¼	0	0	0	0
Traditional Cultural Properties[2]	NSO ½	0	0	0	0
Westslope Cutthroat Trout Habitat (99-100% pure)	NSO ½	84	4,775	6,099	10,958
Wetlands, Floodplains and Riparian Areas	NSO	1,965	4,522	4,959	11,445
Wildlife Management Areas	NSO	2,971	34,971	28,050	65,992
Timing Limitations					
Bald Eagle Breeding Habitat	TL 2/1-8/31 1	4,179	4,129	1,230	9,538
Big Game Winter/Spring Range	TL 12/1-5/15	102,198	187,180	209,595	498,973
Bighorn Sheep Yearlong Range	TL 11/1-6/30	30,109	26,067	75,103	131,279
Ferruginous Hawk Breeding Territories[2]	TL 3/1-7/31 ½	0	0	0	0
Sage Grouse Breeding Habitat	TL 3/1-6/30 3	0	2,751	0	2,751
Sage Grouse Winter/Spring Range	TL 12/1-5/15	538	46,768	19,517	66,824
Controlled Surface Use					
Controlled Surface Use stipulations for TES Species, Cultural and Paleontological Resource Inventory, and Special Status Plant Habitats would apply across the entire Decision Area so acreages were not calculated separately.					
Class 1 Fisheries (Blue Ribbon)	CSU ½	3,300	20,297	6,874	30,470
Developed Recreation Sites	CSU ¼	207	981	1,877	3,064
Gray Wolf Dens – Former Recovery Area	CSU	14,142	8,487	72,071	94,700
Grizzly Bear – Denning Habitat (Distribution Zone)	CSU	34	29,008	24,905	53,947
Grizzly Bear – Recovery Zone	CSU	0	1,651	5,731	7,382
Fluvial/Adfluvial Arctic Grayling Habitat	CSU ½	390	20,944	6,068	27,401
Municipal Watersheds	CSU	13,083	86,169	47,224	146,477
Westslope Cutthroat Trout Habitat (90-99% pure)	CSU ½	0	255	1,939	2,194
Yellowstone Cutthroat Trout Habitat	CSU ½	599	5,050	1,462	7,111

[1]Total acres affected by each stipulation are based on individual, independent, stipulation-specific GIS mapping and have not been overlapped with any other stipulations. Figures are provided here to display which stipulations for which resources are relatively dominant in the Decision Area.

[2]Total values of "0" indicate that there are currently no known sites or acres associated with this particular resource. Stipulation would apply to any newly detected sites or acres.

An analysis of the five areas in the Planning Area considered to be the most prospective for oil and gas exploration and development was completed for Alternative D. Under this alternative approximately eight percent of federal mineral estate in these areas would not be available for oil and gas leasing. Approximately seven percent of the areas would be subject to leasing subject to major constraints (no surface occupancy). Approximately 87 percent would be leased subject to moderate constraints. Approximately five percent would be leased subject to standard terms and conditions. Based on this analysis Alternative D would be the least restrictive of the four alternatives for oil and gas development (**Table 4-34**).

Table 4-34
Alternative D Approximate Acres of Federal Mineral Estate Available or Unavailable for Fluid Mineral Leasing in Potential Development Areas

Classification	Acres
No Lease	**9,821**
No Surface Occupancy	7,981
Timing Limitation	86,286
Controlled Surface Use	6,235
Standard Lease Terms	5,972
Total Available for Oil and Gas Leasing	**106,474**

Locatable Minerals

Effects on lands available for locatable mineral entry would be largely the same as Alternatives B and C. Alternative D has less of an impact than Alternatives B and C and more of an impact on access to mineralized areas than Alternative A (**Table 4-25**).

Salable Minerals

Effects from mining would be the same as Alternative A. Although mitigations for natural resources are not specifically stated in Alternative D, the BLM would apply mitigations, BMPs, and other restrictions on quarrying operations and plans for ultimate reclamation and closure to minimize the impacts on natural resources.

RECREATION

Effects Common to All Alternatives

Vegetative treatments would potentially affect Recreation Opportunity Spectrum (ROS) classes, natural settings, and user experience levels due to changes in apparent naturalness, screening quality and user distribution patterns, and social conflicts.

Prescribed burning could occur more frequently in the Special Recreation Management Areas (SRMAs) outside of the urban interface, which could negatively alter the recreation experiences due to smoke and poor air quality. These impacts would be temporary and could be mitigated or minimized with respect to timing, location, and methods used. Reducing the potential for future large-scale wildland fires would benefit recreation opportunities and experience levels over the long-term.

Managing riparian areas to restore and improve natural functioning conditions would benefit recreation users seeking opportunities for scenic viewing, fishing, bird-watching, hunting, and hiking. Development of new recreation sites and expansion of existing recreation facilities would need to minimize adverse impacts to riparian areas, which could limit site development opportunities and access concentration points to dispersed recreation use areas.

Allowing no new grazing permits on river islands would result in an improvement in water-based recreation experiences for boaters, anglers, nature observers, picnickers, and tent campers in these areas. Managing livestock numbers and practices in a manner that is responsive to all resource needs, combined with interdisciplinary reviews will maintain or enhance recreation experiences over the long-term.

Habitat improvement projects for special status and priority species would have an impact on recreation uses, especially those seeking opportunities for wildlife viewing and hunting. Creating blocks of hiding and security for elk could improve the number of elk and other big game for viewing and hunting.

Minimizing human activities that disrupt habitat during sensitive seasons (breeding periods or during winter) would limit the time and type of recreation uses and travel within these sensitive areas.

Recreation restrictions for aquatic habitat protection may impact water-based recreation and shoreline uses during months of breeding or migrating. Management to enhance or rehabilitate aquatic and riparian habitat would positively impact the angling recreation use in areas where there are nationally recognized sport fishing opportunities, such as the Madison, Big Hole, Jefferson, Missouri, and Yellowstone Rivers.

Developing comprehensive and collaborative travel management plans throughout the Decision Area that are responsive to environmental values and social needs would have varying effects on motorized and non-motorized recreation users. Although the limited travel designation restricts all motorized public travel to designated routes, variances for appropriate uses would be considered and the 300-foot rule exception for dispersed camping, firewood gathering, and game retrieval varies among the 13 Travel Planning Areas in the Decision Area. The 300-foot rule allows dispersed camping in the nine areas where travel plans have not been completed and as per indicated in previously completed site-specific travel plans. Although this rule limits opportunities for recreational firewood gathering and impacts game retrieval, it would enhance ROS classes, travel management, and non-motorized experiences. The 300-

foot rule exception for dispersed camping would allow greater opportunities for motorized camping in primarily rural or motorized semi-primitive recreation settings. The transportation system would continue to provide access to a variety of recreation opportunities and experiences. Conducting scheduled recreation site and route condition assessments and maintaining these facilities in accordance with BLM standards would promote public safety, and enhance recreation opportunities and visitor expectations.

All existing recreation sites would continue to be managed for public use and enjoyment. The more developed fee sites where visitation is highest would be given priority for funding to ensure that user expectations are met.

Limiting camping stays to 7 days at recreation sites in areas regularly exceeding capacities during fee-use seasons would allow more equitable opportunities for visitors to obtain and enjoy a camping site.

Management of special recreation use permits for commercial, competitive, and special events would continue to be considered on a-case-by-case basis with priority given to existing permittees as new permits would not be issued that conflict with existing permit uses.

The recreational management emphases would be prioritized within designated Special Recreation Management Areas to ensure quality recreation opportunities and experiences are provided. Intensive management in these priority areas would be dedicated to providing quality settings and experiences for recreation opportunities in response to identified market demands.

Management of the six WSAs would continue to provide primitive and unconfined recreation opportunities and solitude experiences in a natural setting. If Congress releases a WSA from further consideration, then the resource protection under the IMP guidelines would not continue and these areas would be managed as specified under each alternative. The Sleeping Giant WSA and the Sheep Creek WSA would be protected as ACECs under each alternative.

BLM would continue to manage recreational resources in a cooperative manner with other agencies, which would promote comprehensive management for a wide diversity of both water and land based opportunities in the Decision Area.

Proposed VRM management would continue to provide for mitigating visual disturbances. This would have a positive impact on recreation resources and experiences by creating a landscape compatible with the recreation settings and SRMA management.

The Sleeping Giant ACEC is the only area that would be managed as an ACEC under all alternatives. Management actions would continue to preserve a natural setting for recreation uses within Sleeping Giant. This management would benefit solitude experiences and opportunities for non-motorized and unconfined forms of recreation.

Motorized recreation uses could be temporarily, seasonally, or permanently restricted in areas with significant soil erosion or soil compaction. This could reduce motorized recreation opportunities to a minor degree on a case-by-case basis.

Management actions to enhance access to BLM lands would positively affect recreation users, because the public would have additional opportunities to enjoy recreation activities on public land.

Solid and fluid mineral actions (road building, exploration, excavation/extraction, and removal) could impact recreation uses due to associated noise, smoke and visible human disturbances. Project-level environmental analyses would consider and mitigate these impacts on recreation use before authorizations are granted.

Effects of Alternative A

Vegetative treatments for grasslands (up to 5,250 acres/decade), forest types (up 7,500 acres/decade) and forest product sales (up to 27 MMBF/decade) would create the second lowest potential of all alternatives for impacts on recreation settings and dispersed recreation uses due to associated disturbances.

Riparian actions would impact dispersed recreation experiences the most and developed site management the least, given that riparian management measures would be less restrictive than with Alternatives B and C.

Assuming implementation of the high end of the proposed ranges of noxious weed treatment acres under the action alternatives, proposed noxious weed treatments under Alternative A (up to 20,000 acres/decade) would be the lowest of all alternatives and therefore impacts on recreationists seeking natural settings could be affected by this alternative the most.

Road management would generally allow existing roads to remain open for public use. This would benefit motorized vehicle users and potentially impact non-motorized recreationists to the greatest degree.

Recreationists seeking organized, motorized events would be affected the least under this alternative since 10 of the 13 Travel Planning Areas would remain available for consideration. Snowmobilers would continue to have the greatest opportunities under this alternative since fewer restrictions would be imposed as 143,206 acres would remain open to cross-country use, and 137,038 acres would be available but limited to established routes.

Motorized opportunities for wheeled vehicle travel would also be the greatest under this alternative as 4,367 acres would be open to cross-country travel and approximately 684 miles of routes (roads and trails) would be available (yearlong or seasonally). Conversely, oppor-

tunities for non-motorized recreationists to enjoy areas free of the sights and sounds of motorized activities would be affected the most.

No outfitter and guide fees would be charged for the commercial fishing and floating use of BLM river and lake access sites. Extensions to the 14-day camping limit would continue to be considered for hunters and other users subject to stipulations. Outfitter and guide permit issuance would continue to be considered for both day-use and overnight camping.

This alternative does not allocate ROS classifications. As a result, no ROS allocation system would be established to help recreation managers communicate and provide appropriate settings for a diverse range of opportunities and experiences. Recreation use could be negatively affected as recreation opportunities would continue to be managed in a manner that is reactive rather than proactive. Planning efforts, recreation opportunities, and management would continue to be prioritized primarily within the five SRMAs. The SRMAs represent over 66,000 acres with recreation management focus, which is more than in Alternative D, but less than in Alternatives B and C (**Table 4-35**).

Motorized and non-motorized recreational uses would continue to be allowed 24 hours a day in the Scratchgravel Hills area. With no change in management, the impacts of this action would be continued violations of travel management restrictions, social conflicts, human caused fires, and illegal activities.

All six WSAs would continue to be managed as WSAs, which would result in no change to the availability of primitive recreation opportunities and experiences provided in WSAs.

Although the Wild and Scenic River suitability study for the four eligible rivers would not be completed, the recreation values associated with these segments would be protected under WSR interim management.

Approximately 56,900 acres would be managed as VRM Class I and II areas and therefore recreation settings governed by these classes would remain primarily natural in character. This alternative would protect the second lowest acreage under these classes compared to other alternatives and includes WSAs and major river frontage lands.

Recreation sites would not be recommended for withdrawal from mineral entry and therefore these sites and the visitor experiences associated with them could be affected by mineral related activities.

This alternative imposes the second lowest amount of restrictive stipulations on solid and fluid mineral activities and therefore related impacts would have a relatively high probability for affecting recreation settings and visitor experiences.

Table 4-35
SRMAs by Alternative

Name	SRMAs Included in the Alternative = X			
	A	B	C	D
Hauser Lake		X	X	X
Lower Holter Lake/Missouri River		X	X	X
Holter Lake/Sleeping Giant[1]	X			
Humbug Spires	X	X	X	
Lewis & Clark National Trail	X			
Pipestone		X	X	X
Scratchgravel Hills	X	X	X	
Sheep Mountain		X	X	X
Sleeping Giant/Missouri River		X	X	
Uppermost Missouri River		X	X	X
Upper Big Hole River	X	X	X	X

Source: BLM Butte Field Office, RMP Alternatives Description, 2005.

[1] The action alternatives split this SRMA into Holter Lake/ Missouri River and Sleeping Giant SRMA.

Effects Common to Action Alternatives

All action alternatives would establish ROS classifications (**Appendix H, Table 4-36)** which would facilitate management of desired recreation opportunities, experience levels, facility developments, and other resource uses.

The majority of the potential SRMAs would target the Community Recreation Tourism Market (RTM). This emphasis would impact recreation management in that a marketing focus would be adopted. This emphasis would be to attract and provide opportunities/services for visitors from nearby communities or from communities dependant on recreation-based tourism.

Upper Big Hole River SRMA would be managed as a Destination RTM and would attract national or regional recreation-tourism visitors and others who value public lands as recreation-tourism destinations.

SRMAs managed for Undeveloped RTM would be Sleeping Giant/Missouri River and Humbug Spires. This management emphasis would attract national, regional, or local visitors who value public lands for the distinctive kinds of dispersed recreation produced by the vast size and largely open, undeveloped character of the recreation setting.

Providing forested, security cover (250-acre, minimum blocks) for big-game would benefit non-motorized recreation uses compared to Alternative A.

Monitoring roads during hunting season could reduce the number of violations and misdeeds, and therefore provide a more enjoyable recreation experience for visitors.

Semi-primitive non-motorized would be the primary ROS classification on BLM lands in the Sleeping Giant/Missouri River (ACEC and eligible WSR portions), Humbug Spires, and Sheep Mountain (northern portion) potential SRMAs. The semi-primitive motorized ROS class would be emphasized in the Sleeping Giant (outside the ACEC). The remaining potential SRMAs would emphasize either the roaded natural or rural ROS class, where human influences are noticeable and interaction with others is typical.

Establishing specific guidance for managing designated boat-in camp sites along the shoreline of Holter Lake and Hauser Lake shoreline (if needed) would address the relationship between resource impact concerns and boat-in dispersed camping opportunities.

Issuing fees through recreation permits to commercial fishing and floating outfitters using developed sites to access state waterways could increase client fees and possibly deter some outfitters from providing fishing and floating experiences to visitors on some water segments.

Additional mitigations on new special recreation permits would potentially affect new permittees more than in Alternative A.

Extending commercial outfitting permits from 5 to 10 years for permittees that demonstrate satisfactory performance standards would improve management efficiency and potentially act as an incentive that could improve outfitter performance standards.

BLM would coordinate with MFWP to manage appropriate uses at BLM launch sites as necessary to ensure quality recreation opportunities and reduce social conflicts on streams and lakes.

Given budgetary constraints, new sites that have partnership support would be given first priority for development. This policy would minimize funding shortfalls at existing sites where investments and traditional uses are established.

Subjecting recreation sites to Land Health Standards could increase mitigation costs at existing sites and potentially limit opportunities for new sites. Conversely, this stipulation would enhance the natural setting of recreation sites as well as associated visitor experiences.

Implementing management guidance for SRMAs and Recreation Management Zones would enhance targeted opportunities, visitor experiences, appropriate facility levels, and settings. Implementing land management consistent with surrounding lands and prescriptions would protect WSA values if released from further consideration as wilderness.

Sleeping Giant, Sheep Creek, Humbug Spires, and Elkhorns Tack-on WSAs would be managed as ACECs

Table 4-36
Proposed Recreation Opportunity Spectrum (ROS) by Alternative

ROS Class	Alt A	Alt B		Alt C		Alt D	
		Acres	% of DA	Acres	% of DA	Acres	% of DA
Semi-primitive Non-motorized	NA	36,800	12%	63,700	21%	30,000	10%
Semi-primitive Motorized	NA	71,800	23%	66,900	22%	37,600	12%
Roaded Natural	NA	171,100	56%	158,100	51%	186,100	61%
Roaded Modified	NA	16,600	5%	15,900	5%	19,600	6%
Rural	NA	11,000	4%	2,700	1%	34,000	11%

Source: BLM Butte Field Office, GIS data, 2005.

which would promote administrative protection of the existing recreation values and opportunities. These areas would continue to offer natural settings and user experiences subject to fewer restrictions governing mineral activities if Congress should remove them from further wilderness consideration.

The action alternatives would require that the two National Trails be managed to consider the adopted ROS classification, VRM classes, travel plans, and oil and gas stipulations. Re-routing the Continental Divide Trail would increase the recreation opportunities for the non-motorized user because the trail segment would traverse through more natural settings and less privately owned property. Recreation experiences for the non-motorized users would improve because the re-route would be closed to motorized uses, which would reduce user conflicts.

ACEC designations for Sleeping Giant (11,679 acres), Humbug Spires (8,400 acres), and the Elkhorns Tack-on (3,575 acres) would continue to be managed for semi-primitive, non-motorized recreation opportunities.

Retaining 298,408 acres in BLM ownership and establishing a high priority for land acquisitions to enhance special management designations and recreation sites would benefit long-term recreation opportunities especially, for non-motorized users.

Managing mineral activities to meet Land Health Standards would benefit natural settings and associated recreation experiences. Providing accessibility to mineralized areas for exploration and development would impact the naturalness of ROS classes and the recreation experiences associated with them. The restoration of abandoned mine lands and hazardous material areas would enhance public safety, ROS classes, and the quality of opportunities across BLM lands.

Effects of Alternative B

Proposed vegetative treatments for grasslands (up to 11,800 acres/decade), shrublands (up to 3,650 acres/decade), forest types (up 18,500 acres/decade) and forest product sales (up to 25 MMBF/decade), although mitigated, would create the second highest potential for impacts on dispersed recreation uses due to associated disturbances. The construction of new permanent roads, although minimized due to resource and travel planning constraints, could impact ROS classes while enhancing motorized travel and access opportunities.

Actions to restore riparian areas would improve dispersed recreation experiences and could affect developed site management the second most of all alternatives, given that Riparian Management Zones would be larger than in either Alternative A or D.

Proposed noxious weed treatments (up to 50,000 acres/decade) would be the second highest and therefore recreationists seeking natural setting experiences could be benefited to the second greatest extent of all alternatives.

Restrictions on prescribed burning would coincide with the peak recreation use season. Although these actions would create some short and mid-term impacts on ROS, long-term benefits should be realized due to a lower likelihood for large scale fire events.

Under Alternative B, where road densities exceed 1 mi/mi^2 in big game winter range and calving areas, there would be no net increase in permanent roads. This prescription would affect motorized users the second most of the action alternatives (more than Alternative D but less than Alternative C), primarily in the four pending travel plan areas for which site-specific travel planning would be done after finalization of this RMP (Missouri Foothills, Broadwater, Jefferson and Park/Gallatin).

Recreationists seeking organized, motorized events would be affected the second most under this alternative as only the Pipestone area would be considered for competitive as well as non-competitive events.

Snowmobile riding opportunities would be reduced to the second greatest extent of the alternatives as 112,682 acres would be open to cross-country use and on 139,921 acres use would be limited to established routes.

Implementing a flat annual Special Recreation Use Permit fee with the long-term goal of developing a coordinated, interagency fee system with MFWP and other agencies would promote fair value revenues from outfitters using waterway access sites for commercial fishing and floating. This alternative would be more efficient than Alternative C for both the customer as well as BLM since there would be less required paperwork and the annual fee would cover all access sites. Preference for granting extensions to the 14-day camping limit during the hunting season would focus on developed recreation campgrounds after the high use fee season. This prescription would better protect resource values while camping opportunities (primarily for hunters) beyond 14 days would be reduced. Restricting special recreation permit camping authorizations during the hunting season to hardened campgrounds and not allowing such uses in developed recreation sites from Memorial to Labor Day weekends would reduce conflicts with public hunters and campers. Impacts to hunting outfitters would be minimal given that no camping permits exist and demands are negligible.

The effects of closing the Scratchgravel Hills area to motorized vehicle uses would reduce use violations, risks of human caused fires, conflicts with proximity residents and law enforcement incidents.

Limiting all BLM boat-in camping opportunities along Holter and Hauser Lake shorelines to designated sites would reduce the number of dispersed recreation sites available along the shoreline.

This alternative would allocate ROS classifications as follows: SPNM–36,800, SPM-71,800, RN-171,100, RM-16,600, and R-11,000. These designations represent a more evenly balanced approach for managing recreation settings, opportunities and experiences for a more diversified representation of settings and experiences as compared to Alternatives C and D. Opportunities for both motorized and non-motorized opportunities within the range of varying settings would be provided most evenly. Approximately 56 percent of the Decision Area would be in the roaded natural ROS (**Table 4-36**).

In addition to the Sleeping Giant area, a large portion of the Elkhorns, Humbug Spires, and Ringing Rocks would be designated as ACECs. ACEC designation would provide long-term protection of each area's ROS values and recreation opportunities. Alternative B provides the second greatest amount of protection associated with proposed ACEC designations of any of the alternatives.

Nine SRMAs totaling 78,700 acres would be designated for priority recreation management, four more than in Alternatives A and D (**Table 4-35**). These SRMAs include areas along major waterways (rivers and lakes), highly natural areas, and OHV riding areas where management demands are the greatest. Pipestone and Sheep Mountain would be newly managed as SRMAs. The majority of these areas would be managed as ROS-Roaded Natural (46 percent) and ROS-Semi-primitive Non-motorized (31 percent).

Recommending Muskrat Creek (2.6 miles) as suitable, and the Upper Missouri River (3.1 miles) as preliminarily suitable as National Wild and Scenic Rivers could provide long-term protection for the associated recreation values (natural viewing, hiking, fishing, and hunting) if designated by Congress. Conversely, no additional protection would be established for the recreation values associated with the Upper Big Hole River and Moose Creek segments since they would not be recommended in this alternative.

Across the Field Office, approximately 80,400 acres would be managed as VRM Class I and II areas and therefore recreation settings governed by these classes would be managed for natural character retention. The remaining 226,900 acres would be managed as VRM Class III and IV which would allow more landscape alterations such as roads which would increase motorized access and travel opportunities. This alternative would have the second highest acreage under Classes I and II and the second lowest acreage under Classes III and IV of all the alternatives.

Under Alternative B, 198 acres in eight recreation sites would be recommended for withdrawal from mineral entry. This would protect these recreation facility investments as well as site opportunities and experiences better than in Alternatives A and D, which propose no new withdrawals for developed recreation sites.

This alternative imposes the second highest amount of restrictive stipulations of all alternatives on solid and fluid mineral activities and therefore related impacts would have a lower probability for impacting recreation settings and visitor experiences than in Alternatives A and D.

Effects of Alternative C

Proposed vegetative treatments for grasslands (up to 2,000 acres/decade), shrublands (up to 750 acres/decade), forest types (up to 8,500 acres per decade), and forest product sales (up to 12 MMBF/decade) would create the lowest potential for impacts on recreation settings and dispersed uses due to associated disturbances from these actions.

Unlike the other alternatives, Alternative C would prohibit new permanent roads associated with forest harvests and timber sales. This prescription would benefit natural recreation settings and limit additional access for motorized-based recreation activities.

Actions to restore riparian areas would improve dispersed recreation experiences and affect developed site management the most of any alternatives, given that Riparian Management Zones would be the most extensive of any alternative.

Impacts from the timing of prescribed fires would be the same as described for Alternative B.

Proposed noxious weed treatments (up to 38,000 acres/decade) would be the second lowest of any alternative and therefore recreationists seeking natural setting experiences would be potentially affected to the second greatest extent due to a relatively small amount of proposed treatments.

Under Alternative C, where road densities exceed 0.5 mi/mi^2 in big game winter range and calving areas, there would be no net increase in permanent roads. This prescription would impact motorized riders the most of all alternatives, primarily in the four pending travel plan areas for which site-specific travel plans would be developed after finalization of this RMP (Missouri Foothills, Broadwater, Jefferson, and Park/Gallatin).

Recreationists seeking organized, motorized events would be affected the most under this alternative since none of these activities would be authorized within the Decision Area. Under this alternative, conflicts with other motorized and non-motorized users would be reduced and groups seeking such events would need to find other non-BLM areas.

Snowmobile riding opportunities would be reduced to the greatest extent of all the alternatives. Designated open areas (to cross-country use) would be reduced to 26,148 acres; closed areas would be increased to 65,270 acres; and limited areas would be increased to 215,891 acres.

Implementing Special Recreation Use Permits and established fees would increase costs to outfitters using BLM sites to access state waterways the most of any of the alternatives. This prescription would displace some outfitter fishing and floating use to non-BLM site segments and it would not be as customer friendly as Alternative B or D due to the need for additional permits and actual use statements. In addition, BLM would incur higher management demands than from any other alternatives due to the large number of permits and required process procedures.

The effects of eliminating variances to the 14-day camping limit would best protect recreation settings while camping opportunities (primarily for hunters) beyond 14 days would be reduced the most compared to the other alternatives. Impacts of restricting commercial camping uses would be similar to Alternative B.

Although closing the entire Scratchgravel Hills area to both motorized and non-motorized recreational uses after dark (dusk to dawn) yearlong would best protect the area from violations, management and law enforcement demands would increase compared to Alternatives A, B, and D. Impacts on legitimate public users would be negligible as their use of the area after dark is minimal.

Closing the entire BLM shoreline on Holter and Hauser Lake to boat-in camping except at developed sites would eliminate opportunities for dispersed camping and best protect the natural conditions within these recreation settings.

This alternative maximizes the acreage designated under ROS as semi-primitive non-motorized at 63,700 acres which is about twice that of Alternatives B and D (**Table 4-36**). The effects of this increase would enhance opportunities for hiking, walk-in hunting, mountain biking, horseback riding and other forms of non-motorized uses. Conversely, motorized uses would be eliminated within these areas.

Alternative C would designate the same nine SRMAs as Alternative B (**Table 4-35**); however, most of the SRMAs would be within the semi-primitive, non-motorized ROS, 46 percent, with the roaded natural ROS encompassing approximately 31 percent (**Table 4-36**).

Recommending all four river segments (12 miles) as suitable National Wild and Scenic Rivers would provide the greatest long-term protection of any of the alternatives for the associated values if designated by Congress.

Alternative C would manage the most areas and acres under ACECs. Impacts on recreation from the Sleeping Giant and Humbug Spires ACECs would be the same as that described in "Effects Common to Action Alternatives". Impacts on recreation from the Ringing Rocks ACEC would be the same as that described for Alternative B.

Management of the Elkhorn ACEC and the addition of Spokane Creek (14 acres) would have similar impacts on recreation uses as described for Alternative B, except Alternative C would emphasize more opportunities for non-motorized recreation.

At the Field Office scale, this alternative would designate 99,100 acres under VRM Class I and II areas. The natural character of the recreation settings within these classes would be best protected from disturbances than in any other alternative. The remaining 208,200 acres would be managed as VRM Class III and IV which would allow more landscape alterations such as roads and would increase motorized access and travel opportunities. This alternative has the highest acreage under Classes I and II and the lowest acreage under Classes III and IV of all alternatives.

As with Alternative B, recommending 198 acres in eight recreation sites for withdrawal from mineral entry would protect these recreation facility investments as well as site opportunities and experiences better than in Alternatives A and D that do not propose these withdrawals.

This alternative would impose the highest amount of restrictive stipulations on solid and fluid mineral activities of all alternatives and therefore related activities would have a lower probability for impacting recreation settings and visitor experiences than with any other alternative.

Effects of Alternative D

Proposed vegetative treatments for grasslands (up to 3,500 acres/decade), shrublands (up to 6,800 acres/decade), forest types (up 23,250 acres/decade) and forest product sales (up to 30 MMBF/decade) would create the highest potential of any alternative for impacts on recreation settings and dispersed uses due to associated disturbances from these actions.

Effects of riparian, forest product roads and re-issuance of grazing permit actions would be similar to Alternative A.

Proposed noxious weed treatments (up to 61,000 acres/decade) would be the highest of any alternative and therefore impacts on recreationists seeking natural setting with fewer invasive weeds could be benefited by this alternative the most.

Under Alternative D, where road densities exceed 1.5 mi/mi^2 in big game winter range and calving areas, there would be no net increase in permanent roads. This prescription would have the second lowest impacts on motorized riders in the four pending travel plan areas for which site-specific travel plans would be developed after finalization of this RMP (Missouri Foothills, Broadwater, Jefferson, and Park/Gallatin) since road densities would be more restrictive under Alternatives B and C.

Groups seeking organized motorized activities would be affected less than under Alternative C as the Pipestone

Area would remain available for competitive and non-competitive, motorized events. Areas open to snowmobiles and effects on users would be similar to Alternative B.

Special recreation use permits would not be required for commercial fishing and floating outfitters that use BLM river and lake access sites, until a multi-agency statewide fee system is established. Of all alternatives, Alternative D would be the most customer-friendly and management-efficient method of obtaining fair value returns from commercial users should the state and other agencies decide to participate.

The effects of managing variances to the 14-day camping limit; access within the Scratchgravel Hills; commercial camping permits; and boat-in camping along Hauser and Holter Lakes would be the same as with Alternative A as no changes in current management would occur in Alternative D.

With regard to ROS designations, Alternative D would be similar to Alternative A in that about 90 percent of the total Decision Area would be managed under ROS designations that allow motorized activity (**Table 4-36**).

Planning efforts, recreation opportunities, and management would continue to be prioritized within five SRMAs, as in Alternative A (**Table 4-35**). These SRMAs represent the highest visitor use areas where facility infrastructure and improvements are the greatest.

None of the four eligible river segments would be recommended as suitable for National Wild and Scenic River designation by Congress. Consequently, the ROS and primitive forms of recreation would be subjected to additional resource uses and associated impacts.

Impacts on recreation from management of the Humbug Spires and Sleeping Giant ACECs would be the same as described in Alternative B. The Elkhorns ACEC would be limited to the existing WSA boundary, about 3,575 acres. This designation would ensure that semi-primitive non-motorized recreation opportunities would continue to be provided and emphasized, if the WSA were to be removed from Congressional wilderness consideration. Not designating Spokane Creek and Ringing Rocks could potentially subject these natural settings to increased impacts associated with other resource uses.

This alternative would be the least protective of recreational opportunities and experiences that are dependent on high quality visual resources since the lowest acreage (38,100 acres) would be managed as VRM Classes I and II.

Mineral entry withdrawal recommendations and their effects would be the same as Alternative A.

This alternative imposes the lowest amount of restrictive stipulations on solid and fluid mineral activities of the action alternatives and therefore related impacts would have a higher probability for affecting recreation settings and visitor experiences than Alternative B or C.

Travel Management and Access

Effects Common to All Alternatives

Travel Management – Field Office Level

Restrictions on surface-disturbing activities associated with recreation management, special designations, vegetation management, water quality, watershed and soils management, and wildlife and fisheries management could modify the locations and routes of proposed roads and road realignments.

Access developed for mineral extraction and timber harvesting could enhance travel and access opportunities. Restrictions on road development in areas with important resource values could limit the degree of increased access and travel opportunities.

Vegetation management could affect transportation by providing more roads that could be considered for designation under the travel management system. Additionally, during an active vegetation project, temporary closure of existing roads could be required for safety reasons. The potential for, and degree of these impacts would depend largely on the acres treated and miles affected.

Enhancing and protecting riparian and wetland vegetation could directly affect travel management through the temporary or permanent closure of roads and trails. Effects would be short or long-term, depending on temporary or permanent restrictions. Closures for resource protection could result in an overall net decrease of available routes in the Decision Area. Activities within riparian areas to maintain and restore riparian habitat could lead to roads and trails being relocated outside of riparian areas.

Route restrictions and closures could occur during wildland fire management activities, directly affecting travel management. Short-term effects could include an increase of fire management equipment traffic on BLM-administered routes, and an increase of motorized vehicle traffic on routes that remain accessible until fire management activities stop. Managing invasive species and noxious weeds could potentially cause short-term impacts on travel by temporarily displacing users from closed or restricted treatment areas.

Implementing recovery programs, mitigation activities, or projects to avoid impacts or to enhance riparian and wetland resources or listed plants could affect travel management if travel routes need to be relocated or closed. Effects would be short or long-term depending on the timeframe (temporary or permanent) of the restriction.

Travel management prescriptions and activities in all alternatives would designate areas as either "Open",

"Closed" or "Limited", and routes as Open Yearlong, Open with Restrictions, Closed Yearlong, Decommissioned, and Game Retrieval. Four existing travel management plans designate areas as Limited, with a few exceptions in Elkhorn Mountains and Whitetail-Pipestone. There is a direct correlation between area/route management decisions and the level (and quality) of recreational opportunities available to either motorized or non-motorized users. For motorized users, a reduction in the availability of motorized areas and designated routes means relatively fewer motorized opportunities. Simply stated, there would be fewer areas and miles of designated roads or motorized trail available for full sized or OHV vehicles to travel upon, either for recreational driving, or for access. Conversely, for non-motorized users, fewer motorized areas and designated routes means more area and miles of closed roads or trails available for quiet, non-motorized (hiking, biking, horseback riding) recreation use.

Likewise, there is a direct correlation between travel management decisions and the level of conflict between motorized and non-motorized users. Travel management decisions that create separate use areas reduce conflict between motorized and non-motorized recreation users. Conversely, travel management designations that mix motorized and non-motorized recreation use lead to increased conflict.

Additionally, dispersing use activity within areas primarily managed for either motorized or non-motorized use would provide a higher quality of recreational experience. Simply stated, regardless of the type of recreation activity (motorized, non-motorized, etc.) dispersing users over a larger area would result in fewer encounters, improving road/trail safety and providing a higher quality of recreational experience.

Conversion of temporary area closures to permanent area closures would reduce motorized access. New easement agreements with private landowners could increase accessibility for motorized and non-motorized travel into BLM lands. Agreements for interagency travel management could lead to improved trail accessibility, which could increase route connectivity.

Establishing and maintaining information kiosks would enhance user compliance, public safety, and enjoyment.

Under the existing Sleeping Giant travel management plan, motorized wheeled vehicle access would remain restricted to designated routes only. No snowmobile use would be allowed, including travel on designated routes. The Sleeping Giant area would not be available for organized, motorized events.

Any expansion to the Lewis and Clark National Trail system would be related to the day-use activities or lake access for water-based recreation opportunities.

Road and trail access in the Scratchgravel Hills area could increase with expanded hiking, mountain biking, horseback riding, hunting, and other recreation activities.

Under the existing Clancy-Unionville travel management plan, motorized wheeled vehicle access in the Sheep Mountain area would remain restricted to designated routes only. Cross-country snowmobile travel would continue to be permitted south of the Jackson Creek county road during the season of use (December 2-May 15), snow conditions permitting. Under the existing Whitetail-Pipestone travel management plan, motorized wheeled vehicle access would remain restricted to designated routes only. Cross-country snowmobile travel would continue to be permitted (on designated routes as well) during the season of use (12/2-5/15), snow conditions permitting. Travel management would continue to be exclusively non-motorized in the Wilderness Study Areas and would be maintained at current levels. No transportation or access impacts would be expected.

VRM classifications would limit the type, location, and density of roads in the Decision Area. Visually sensitive areas would be more restrictive on transportation system expansion.

Management within ACECs could affect transportation and travel management. Routes determined to be affecting values for which the designations were established could be relocated, reconstructed, or decommissioned.

Under the existing Sleeping Giant travel management plan, the non-WSA portion of the Sleeping Giant ACEC would continue to be managed as primarily non-motorized, with no impact.

Management of soil-disturbing activities could decrease the number of roads and trails available for motorized use for all or part of a year. Management actions would target highly traveled recreation areas for sediment reduction, which would limit access to certain recreation places.

Activities and projects to protect or maintain watersheds could result in seasonal route restrictions or permanent road closures, reducing motorized travel opportunities. Protective measures for cultural resources could affect travel management at specific sites. Restrictions on roads could result in an overall reduction in available routes.

Land acquisitions and easements could improve public access, expanding both motorized and non-motorized opportunities. Lands identified for disposal could decrease public access

Minerals management, including heavy equipment and truck traffic could affect public access, although, most effects would be short term and would only occur during development activities. New permanent routes established for mineral development could increase public access.

Minerals activities in areas with special-status or priority species would be designed to mitigate impacts, which could prohibit or restrict public access to roads.

Activities related to cleanup, remediation, and closure of contaminated or abandoned mine sites could result in the closure of system roads as well as trails to prohibit public access to these hazardous sites.

Remediation of hazardous materials to protect public health and safety could cause temporary or permanent closure, decommissioning, or restriction of some access roads to motorized and non-motorized travel.

Effects of Alternative A

Travel Management – Field Office Level

This alternative would continue to allow all existing travel plans, including sub-planning and emergency area closures, to be brought forward and remain in effect.

New route construction (up to 5.5 miles per year) could occur during forest product management activities. This could increase road density for both motorized and non-motorized users. New road construction allowed under Alternative A would be more than the action alternatives.

In the Elkhorn Wildlife Management Area, new road construction would be kept to a minimum and all new roads would be closed to the public.

Wheeled travel management would continue in accordance with the 2003 Statewide OHV ROD and Plan Amendment. The ROD did not address snowmobile management. Under Alternative A, existing snowmobile management would be brought forward along with alternative proposals for the five activity level travel plans being developed with this RMP revision, and area designations for four travel plan areas for which activity level plans will be developed in the future. Availability of areas for snowmobiling would be greater than under any other alternative.

Under Alternative A, BLM would continue to allow recreational activities including motorized vehicle uses within the Scratchgravel Hills 24 hours a day. This would lead to continued illegal activities (underage drinking, vandalism, dumping) as described under the Activity Level Plans for the Helena TPA.

Effects Common to Action Alternatives

Travel Management – Field Office Level

Seasonal wildlife closures would create short term impacts on travel and access to these areas. Maintaining core blocks of 250 acres of unroaded or closed roads during hunting season for big game protection under the action alternatives would affect existing routes by concentrating use on fewer roads than under Alternative A.

Relocating/aligning roads to reduce sedimentation, identifying and removing unnatural barriers, eliminating fish passage barriers, and restoring or maintaining riparian vegetation would have no effect on the transportation system as long as routes are not restricted or closed. Under all action alternatives, the effects of management for fish on transportation and travel management would be greater than under Alternative A.

Closure, decommissioning, or re-routing segments of the existing transportation system could result from the route-by-route evaluations within each Travel Planning Area. Social and environmental considerations would be made when evaluating individual TPAs.

All action alternatives would allocate the same acres of Open, Limited, and Closed Area Designations for wheeled motorized use (**Table 4-37**). The alternatives differ in their selection of Open Yearlong, Open with Restrictions, and Closed route designations.

Table 4-37
Field Office Level Acres of Open, Limited, and Closed Area Designations

Indicator	Alt A	Alt B	Alt C	Alt D
Wheeled Vehicles				
Open	4,367	283	283	283
Limited	271,442	275,526	275,526	275,526
Closed	31,500	31,500	31,500	31,500
Total	307,309	307,309	307,309	307,309
Snowmobiles				
Open	143,206	112,682	26,148	139,138
Limited	137,038	139,921	215,891	136,889
Closed	27,065	54,706	65,270	31,282

Source: BLM Butte Field Office transportation GIS database, 2005.

Under the action alternatives, motorized wheeled cross-country travel would be allowed during any military, fire, search and rescue, or law enforcement emergency.

The 2003 OHV ROD did not address snowmobile management. Under the action alternatives, existing snowmobile management would be brought forward along with alternative proposals for the five activity level travel plans being developed with this RMP revision, and area designations for four travel plan areas for which activity level plans will be developed in the future. Alternatives B and C would provide for less snowmobile use (both area and designated route availability) than Alternatives A and D. Alternatives B and C would help reduce conflicts between non-motorized users (cross-country skiers, snowshoers) and snowmobilers, providing separate areas of use. Alternative C would provide

the highest level of opportunities for non-motorized winter recreationists, and the lowest level of conflicts between motorized and non-motorized winter recreationists of all alternatives.

A feasibility study would be conducted to determine if a motorized section of the Continental Divide National Trail could be re-routed to enhance the non-motorized experience and reduce user conflicts. This action would be done in cooperation and coordination with the Forest Service.

The Humbug Spires potential ACEC would be closed yearlong to all motorized travel in order to protect natural and scenic values. No new roads or motorized trails would be authorized.

Effects of Alternative B

Travel Management – Field Office Level

Under Alternative B, road density levels in big game winter and calving ranges (1 mi/mi^2) would result in a net decrease of available motorized routes. This effect would be less than under Alternative C, but more than under Alternatives A and D.

Prohibiting competitive motorized events would result in long-term effects on users who prefer these activities.

Placing restrictions on cross-county snowmobile travel in some areas would create long-term effects on users who prefer to recreate in this manner.

Acquiring easements to access popular travel routes could result in an increase in the overall route network and expand both motorized and non-motorized opportunities.

The signing and long-term monitoring required under Alternative B would result in an increase in BLM travel management costs compared to Alternatives A and D.

With the exception of a few routes needed for residential access, public access would be restricted to non-motorized trailheads. As a result, illegal activities (underage drinking, vandalism, dumping) in the Scratchgravel Hills would be substantially reduced. Travel management costs would increase for signage and user compliance monitoring under Alternative B. See Activity Level Planning for Helena TPA.

Managing special designations in a way that would restrict certain motorized and non-motorized activities from jeopardizing resource values special to the area would potentially alter the transportation network or by restricting access.

Route closures and prohibitions on new construction in the Spokane Creek and Elkhorns potential ACECs could directly affect visitors by restricting access to some sites and would result in an overall reduction in routes available to motorized users. Non-motorized opportunities in this area would increase.

Motorized route closures would be maintained in accordance with the Pipestone Travel Plan for the Ringing Rocks Potential ACEC.

Effects of Alternative C

Field Office Travel Management

Impacts to travel management from forest treatments would be greater under Alternative C than the other alternatives. Forest treatments would occur in areas already accessible by the current transportation system under Alternative C. No new permanent roads would be constructed and temporary road construction would be kept to a minimum. Temporary roads would be decommissioned within one year of project completion.

Impacts from the management of special status and priority species would be similar to Alternative B, except this alternative would have more strict resource protection.

Disallowing competitive and organized motorized events under Alternative C would result in long-term effects on users who engage in these types of activities.

Restrictions placed on snowmobile travel would create long-term effects on users who prefer cross-country snowmobile use.

Seeking public access easements for all locations where BLM routes are accessed either from or cross private property could increase the overall route network and expand both motorized and non-motorized opportunities.

Closing the entire Scratchgravel Hills area to motorized and non-motorized recreational uses after dark yearlong would decrease illegal activities but would increase travel management costs for signage and user compliance monitoring. See Activity Level Planning for Helena TPA.

Managing special designations to restrict certain motorized and non-motorized activities that may jeopardize resource values would result in route restrictions. This could directly affect visitors by limiting accessibility to some sites and could result in an overall reduction in routes available to access public lands. Alternative C is more restrictive than the other action alternatives

Managing recreation settings and opportunities in accordance with Alternative C ROS classifications would result in the greatest amount of non-motorized recreation and least motorized recreation under Alternative C compared to the other alternatives.

Route closures and prohibitions on new construction in the Spokane Creek and Elkhorns potential ACECs could directly affect visitors by restricting access to some sites and would result in an overall reduction in routes available to motorized users. Non-motorized opportunities in this area would increase.

Unlike Alternatives B and D, this alternative would not allow new or existing mineral operations to construct access roads within Riparian Management Zones for mineral development.

Effects of Alternative D

Field Office Travel Management

Effects of forest management would be similar to those identified under Alternative A. Under Alternative D, some new roads may be built for long-term management of areas where multiple entries would be necessary to meet objectives but new and temporary road construction would be kept to a minimum. Some new permanent roads could be "Open Yearlong" to the public if travel plan objectives for the area are met. The degree of new road construction under Alternative D would be less than Alternative A, but more than would be allowed under Alternative B.

Alternative D is less restrictive on management actions that affect travel management than the other action alternatives and could result in more routes in the transportation system.

Allowing no net increase in permanent open road mileage in areas where open road densities are 0.5 mi/mi^2 or less in big game winter and calving ranges and reducing open road densities in big game winter and calving ranges where they currently exceed 1.5 mi/mi^2 would result in an overall net decrease of available motorized routes but to a lesser extent than under Alternatives B and C. Opportunities for walk-in hunters and other non-motorized enthusiasts would also be less than the other action alternatives.

With some exceptions (see activity level plan alternatives), cross-country snowmobile use would be allowed, as well as travel on all existing routes during the season of use (12/2-5/15), snow conditions permitting. Conflicts between non-motorized users (cross-country skiers, snowshoers) and snowmobilers would be expected to continue or increase as a result.

Evaluating competitive and non-competitive motorized events on a case by case basis for the Pipestone area could result in more opportunities for these types of events than under the other action alternatives.

Seeking public access easements for all locations where BLM routes are accessed either from or cross private property would result in an increase in the overall route network, expand both motorized and non-motorized opportunities, and enhance connectivity.

There would be a moderate increase in travel management costs due to initial implementation efforts (signing), and long-term monitoring (trail ranger patrols). This effect would be similar to Alternative B, but less than Alternative C.

Allowing motorized and non-motorized recreational uses 24 hours per day in the Scratchgravel Hills would lead to continued illegal activities, similar to current conditions. See Activity Level Planning for Helena TPA.

Managing special designations in a way that would restrict certain motorized and non-motorized activities that could jeopardize resource values special to the area could result in direct effects on the transportation management system.

Managing recreation settings and opportunities in accordance with Alternative D ROS classifications would result in the greatest amount of motorized recreation and the least amount of non-motorized recreation than any of the alternatives.

Transportation Facilities

Effects associated with RMP management are discussed below. Effects associated with the five site-specific travel plans at the scale of each TPA as well as at the Field Office scale are discussed in the "Environmental Consequences of Five Site-Specific Travel Plans" section.

Effects Common to All Alternatives

Future vegetative regimens and activities have the potential to affect transportation facilities by providing more roads that could require periodic stabilization, sign maintenance, and bridge and culvert maintenance.

Temporary routes would be constructed where other routes are not available under approved travel management plans. BLM would construct such routes to minimal standards and implement BMPs that supplement basic guidelines for road planning, construction, drainage, and maintenance.

Route location could be affected by forest product activities, directly affecting transportation facility management. Under all alternatives route locations would be determined on the basis of topography, drainage, soil type, and other natural features to minimize erosion. Skid roads would be rehabilitated by seeding and/or scarification. Short-term effects could increase maintenance costs to comply.

Maintenance of BLM roads and facilities would create safer conditions for the public and provide for administrative uses. Certain resources could be affected directly by surface-disturbing maintenance activities or indirectly as a result of increased use or traffic generated by improved travel routes.

Effects of Alternative A

Effects associated with Alternative A are described under "Effects Common to All Alternatives". Estimated costs for annual maintenance and periodic stabilization would be about 30 percent more than under the action

alternatives (see the "Environmental Consequences of Five Site-Specific Travel Plans" section).

Effects Common to Action Alternatives

Subjecting road maintenance to seasonal timing restrictions to mitigate impacts of human activities on important seasonal wildlife habitat could have short-term effects on facilities management by increasing the planning effort and reducing the economic efficiency of maintenance activities, depending on whether routes in these areas are among those maintained by BLM.

Reducing open road density in big game winter and calving ranges and grizzly bear distribution areas could have indirect effects on facilities management. By condensing current use on fewer roads there could be increased maintenance required and possibly a decrease in public safety due to increased traffic. However, reducing open road miles in these areas would reduce the number of road miles that would need maintenance, thereby contributing to reduced maintenance costs.

Designing roads to reduce the effects of fisheries resources could have short-term economic effects on facility management depending on whether the specifications for these protective features increase project costs or whether additional maintenance would be necessary to ensure their effectiveness.

Installing gates or other barriers at roads and trails closed to the public would have a direct affect on facility management. Increased personnel would be needed to install and maintain these fixtures and therefore, facility management costs would increase.

Under all action alternatives, there would be a moderate increase in facility management costs due to initial travel plan implementation efforts (signing, trailhead development) and sign maintenance. Route maintenance costs would be lower than current levels, due to the overall reduction in available routes.

Designing and maintaining roads in a manner that provides for water quality protection would result in an increase in facility management costs. Controlling placement of fill material, keeping drainage facilities open, following BLM culvert design standards, and repairing ruts and failures to reduce erosion and sedimentation of aquatic habitats would involve additional planning efforts and could result in additional personnel time during maintenance activities.

Effects of Alternative B

Under Alternative B, replacing barbed wire gates with cattle guards and easily operated metal gates (wherever problems are known to occur) would result in a short-term increase in transportation facilities costs. However, due to the overall reduction in available routes under Alternative B, transportation facility costs would be lower than current levels (see the "Environmental Consequences of Five Site-Specific Travel Plans" section).

Higher design standards under Alternative B, such as outsloping roadway surfaces where possible, minimizing disruption of natural hydrologic flow paths, and minimizing road and landing locations in RMZs may result in a short-term increase in transportation facility costs due to increased engineering efforts during route design and a long-term increase from culvert maintenance compared to Alternative A. Similar effects would be realized from Alternative D.

Effects of Alternative C

Under Alternative C, installing cattle guards and gates on newly constructed roads and trails, as needed, would result in a short-term increase to transportation facility costs. However, due to the overall reduction in available routes under Alternative C, transportation facility costs would be lower than current levels (see the "Environmental Consequences of Five Site-Specific Travel Plans" section).

Higher design standards under Alternative C, such as maintaining stream crossings that would withstand a 100-year flood event, may result in a short-term increase in transportation facility costs due to increased engineering efforts during route design. Less maintenance would be required under Alternative C than under the other action alternatives due to higher capacity drainage fixtures.

Effects of Alternative D

Under Alternative D, replacing barbed wire gates with cattle guards and easily operated metal gates (wherever they currently exist) would result in a short-term increase in cost for transportation facility management. However, due to the overall reduction in available routes under Alternative D, transportation facility costs would be lower than current levels (see the "Environmental Consequences of Five Site-Specific Travel Plans" section).

Increased levels of reconstruction and new route construction to restore deteriorated routes and provide additional loop routes would result in a short-term increase in transportation facility costs for the signage, culverts, and bridges that may be required and a long-term increase for route maintenance.

Higher design standards under Alternative D, such as outsloping roadway surfaces where possible and minimizing road and landing locations in SMZs may result in a short-term increase in transportation facility costs due to increased engineering efforts during route design and a long-term increase from culvert maintenance compared to Alternative A. Similar effects would be realized from Alternative B.

LANDS AND REALTY

This section includes discussion of effects on land tenure adjustments, land use authorizations, utility corridors, and communication sites.

Effects Common to All Alternatives

Effects analysis indicated that vegetation, travel management, and abandoned mine lands would not have impacts on lands and realty.

While management actions for livestock grazing vary among the alternatives, the impacts to the Lands and Realty Program are essentially the same. In areas where livestock grazing occurs, land use authorizations such as rights-of-way and BLM access easements could be required to include conditions and or mitigation measures that limit livestock grazing during the construction and rehabilitation phases of the project, and facilitate livestock movement and public travel (e.g., fencing and cattle guards) throughout the effective period of the authorization. Percentage of the Decision Area (DA) available for livestock grazing would be 93 percent under Alternatives A and D, and 90 percent under Alternatives B and C.

In general, wildland fire management actions would help protect facilities on public lands authorized through the Lands and Realty Program by reducing fuel loads and suppressing fires. However, there is always a slight possibility of losing control of prescribed fire and damaging the above-ground facilities.

Management actions to identify, protect, and conserve special status plant and animal species would impact land use authorizations, land ownership adjustments, and acquisition of legal and physical access to public lands. Facilities proposed to be constructed under various land use authorizations or access easements in areas where these types of vegetation and animal species are present may need to be mitigated, constructed in alternate locations, or in extreme cases, dropped from consideration. The need to protect these resources could also result in the restructuring or elimination of a land ownership adjustment proposal such as an exchange or sale.

Recreation management actions, including designation of Special Recreation Management Areas, could result in land ownership adjustments or easement acquisitions in order to improve access to public lands for recreation opportunities.

Under all alternatives, the six existing Wilderness Study Areas would continue to be managed under the Interim Management Policy and Guidelines for Lands under Wilderness Review (BLM Handbook H-8550-1, dated 1995) until such time as Congress either designates them as wilderness or releases them from further consideration as wilderness. Such management would impose restrictions on the use of these areas for land use authorizations and land disposals.

Managing the national trails located within the DA to protect the values for which they were designated could impact land use authorizations such as rights-of-way as well as BLM actions to obtain legal and physical access to public lands. Proposed facilities such as power lines may need to be mitigated (e.g. burial of the line) or re-routed in order to protect trail values. Land ownership adjustments such as sales or exchanges may need to be restructured or eliminated from consideration in order to avoid disposing of public lands containing important trail segments.

Visual Resource Management under all alternatives would affect land use authorizations such as rights-of-way, leases, and permits. Facilities would need to meet objectives for the particular VRM class in which a project was proposed. This could include mitigation, relocation, or elimination of certain facilities resulting in additional time and costs in project development.

Management actions to protect soil, air, and water quality could affect land use authorizations such as rights-of-way, leases, and permits, as well as BLM actions to obtain legal and physical access to public lands. Proposals for facilities and actions that would degrade these resources would have to be mitigated, sited in acceptable alternative locations, or in more extreme cases, denied altogether. Applicants for such proposals could encounter time delays and greater costs in terms of project development.

Management of cultural resources could affect several aspects of the Lands and Realty Program including land use authorizations, land ownership adjustments, and the acquisition of legal and physical access to public lands. These lands and realty actions are considered federal undertakings and must avoid inadvertent damage to federal and non-federal cultural resources through compliance with Section 106 of the National Historic Preservation Act. Cultural inventories would need to be completed prior to these federal undertakings and impacts to important cultural sites would need to be avoided by project redesign, project abandonment, and/or mitigation of adverse impacts through data recovery. This could result in actions such as re-routing a proposed right-of-way or road easement, or restructuring or abandoning a proposed land ownership adjustment such as a land exchange or sale. Such actions can increase processing costs and processing time for both the federal and non-federal parties.

Impacts from the management of paleontological resources would be similar to those of cultural resources. Lands and realty projects occurring in known fossiliferous areas would require that adequate time and resources be allocated to conduct resource inventory. The discovery of scientifically important paleontological resources could result in the rerouting or redesign of proposed land use authorizations and easement facilities. The presence of these resources could also lead to the restructuring or abandoning of land ownership adjustments such as land

exchanges or sales. Such actions can increase processing costs and time for both the federal and non-federal parties.

Locating new right-of-way facilities within or adjacent to existing rights-of-way would minimize the number of acres designated for new right-of-way development. Implementation of *Suggested Practices for Raptor Protection on Power Lines* (APLIC 1996) and Best Management Practices (BMPs) established in the Programmatic Wind Energy EIS and ROD (December 2005) would require mitigation for wildlife impacts on new rights-of-way development.

The Interagency West-wide Energy Corridor Programmatic EIS currently being prepared will identify energy corridors on BLM and other federal lands. The Final PEIS will provide plan amendment decisions that will address energy corridor related issues, including the utilization of existing corridors, identification of new corridors, supply and demand considerations, and compatibility with other corridor and project planning efforts. Identification of corridors in the PEIS may affect the BFO, and the approved PEIS would subsequently amend the Butte RMP.

Reviewing existing withdrawals and classifications and revoking or terminating those that are no longer serving their intended purpose would ensure that public lands are not unnecessarily encumbered and are open to the widest possible array of public land uses consistent with other portions of the plan. Such reviews would also ensure that withdrawals and classifications still serving their intended purpose would remain in place. Withdrawal proposals under all alternatives would be in conformance with current withdrawal and energy policies and would ensure that such actions encumbered the minimum area necessary to achieve the intended purpose.

New withdrawal proposals would be limited to the minimum area required for the intended use, would require strong justification, and would be initiated only where applicable alternative prescriptions, such as the use of rights-of-way, leases, permits, or cooperative agreements, are inadequate to protect the resource values.

Recommendations developed by the BLM/Secretary of the Interior and Department of Army/Department of Defense on the proposed withdrawal at Limestone Hills will be submitted to Congress. Congress and the President will then determine whether the withdrawal should be enacted, and the amount of public land to be withdrawn. Up to approximately 20,000 acres of public land could potentially be transferred to the administration of the Department of the Army, or managed cooperatively with the BLM. The EIS for this withdrawal would subsequently amend the Butte RMP.

Consideration of land ownership adjustments on a case-by-case basis would allow for flexibility in managing public lands to achieve improved management efficiency or enhance other programs. BLM-administered land within disposal areas would be made available for disposal through sales or exchanges or both. BLM lands to be sold would meet the disposal criteria from the Federal Land Policy and Management Act of 1976.

Actions such as exchanges, sales, and purchases would adjust the relatively fragmented public land pattern to better manage public lands over the long-term. Consolidation of public land holdings could facilitate access to public lands and reduce the number of access easements needed. Consolidation could also lead to a reduction in encroachment problems on public lands from adjacent property owners as a result of fewer private inholdings within the DA.

Lands that meet Recreation and Public Purposes Act (R&PP) classification criteria for public purposes would be made available for state and local governments and other organizations. This would assist those entities in meeting the need for reasonably priced land to serve a broad array of public needs.

Access to public lands would be improved by the pursuit of land exchanges, easement acquisitions, and land donations.

The management of leasable, salable, and locatable minerals under all alternatives would likely result in requests for land use authorizations such as rights-of-way and permits for utilities and access.

Any renewable energy developments proposed for public lands managed by the BFO within the DA lands could result in requests for land use authorizations such as rights-of-way and permits. There are two areas where wind energy developments are anticipated to occur: one near Whitehall in the vicinity of Golden Sunlight Mine and one near Livingston.

In terms of health and safety, land use authorizations for uses which would involve the disposal or storage of material which could contaminate the land would not be issued. Lands proposed for acquisition or disposal would need to be inventoried for the presence of hazardous materials. The presence of contaminants may lead to actions such as the modification or abandonment of a land ownership adjustment proposal, or remediation in the form of cleanup and removal of the contaminants.

Management to protect prime or unique farm lands would require that actions be reviewed to evaluate their impacts on these resources. Although no prime or unique farm lands have been identified in the Decision Area, adjustments to land use authorizations and land ownership may be required to minimize or eliminate these impacts if prime farm lands are identified on a case by case basis.

Tribal treaty rights on public lands within the DA could impact land ownership adjustments such as exchanges and sales. It is possible that potential actions such as these would need to be restructured or eliminated from

consideration if it were determined that they adversely affected tribal treaty rights.

Effects of Alternative A

BLM forest product sales and stewardship projects may also require road easement acquisitions to cross private lands to secure access to the federal sale or project area. In comparison to the other alternatives, Alternative A would likely have a greater need for access to forested areas than Alternative C but a lesser need than Alternatives B and D.

Management of the four National Wild and Scenic River-eligible river segments to protect wild and scenic river eligibility and tentative classification would result in restrictions or denial of land use authorizations for new facilities such as electric transmission lines, roads, etc.

Management actions to protect relevant and important resource values on ACECs would restrict land use authorizations, land ownership adjustments, and access to public lands within the DA. Under Alternative A, the pre-existing Sleeping Giant ACEC (11,679 acres) would continue to be managed as an ACEC. Under the original management plan no new ACECs would be established. Compared to the other alternatives, Alternative A would have the least impact on the Lands and Realty Program from ACEC management.

Alternative A would provide the greatest flexibility in locating facilities such as transmission lines, pipelines, and communication sites since there would be no designated right-of-way corridors or use areas, 74,489 acres of avoidance areas, and no exclusion areas. The lack of designated corridors could lead to a proliferation of separate rights-of-way which would need to undergo NEPA evaluation. Not designating corridors and use areas for the above-mentioned facility types could result in a greater likelihood that other land uses would preclude the location of these types of right-of-way uses. Not concentrating major right-of-way facilities in certain areas could make them, along with the public which relies on them, less vulnerable to potential natural disasters.

Alternative A (along with Alternative D) would allow for the greatest flexibility in authorizing mineral entry activities by considering withdrawals from mineral entry on a case-by-case basis.

Planning guidance with respect to land ownership adjustment would be the same as that provided by the 1984 Headwaters RMP and the 1979 Dillon Management Framework Plan. Further and more specific guidance would be provided by the "Land Pattern and Land Adjustment, Supplement to the State Director Guidance for Resource Management Planning in Montana and the Dakotas, 1984" (BLM 1984b). This guidance was later amended by the 1989 State Director's guidance pertaining to access. This direction established land exchange as the predominant method of land ownership adjustment. It also established retention, disposal, and acquisition criteria to be used in categorizing public land. Criteria in the supplement were used to identify retention and disposal zones within the DA. These zones would be applied in this alternative.

Under Alternative A, management actions for access would progress toward BLM management goals by following guidance provided by the Headwaters RMP/EIS as supplemented by guidance prepared by the Montana State Office on access (BLM 1989). Alternative A would likely provide the most flexibility than the other alternatives in terms of how and where access could be obtained.

Designation of approximately nine percent of federal mineral estate lands in the DA (54,810 acres) as closed to oil and gas leasing would eliminate effects on land use authorizations, withdrawals, or access from oil and gas leasing in these areas. Under Alternative A, fewer acres would be closed to oil and gas leasing activities than under Alternative C, but more than under Alternatives B and D.

Effects Common to Action Alternatives

Designation of approximately 283 acres (0.10 percent of lands in the DA) as open to wheeled vehicles under the action alternatives would require less road easement acquisitions than Alternative A.

Managing the two National Trails (Continental Divide National Scenic Trail and Lewis and Clark National Historic Trail) in accordance with the Recreation Opportunity Spectrum settings, Visual Resource Management classes, travel plan direction, and oil and gas stipulations established under the action alternatives would further restrict land use authorizations and land ownership adjustments on public lands containing important trail segments. Land ownership adjustments would be required to re-route the Continental Divide Trail segment in coordination with the Forest Service to enhance non-motorized opportunities; reduce current needs for use easements/acquisitions through private lands; and remove user conflicts associated with the motorized road.

Limiting new communication facilities to the seven designated communication sites would concentrate these uses and diminish the proliferation of separate rights-of-way and their associated impacts when compared to Alternative A. Designation of these use areas would put the public on notice that these are the preferred areas for certain types of right-of-way facilities. Designation and management of right-of-way corridors and use areas would make it more likely that these types of right-of-way uses would not be precluded by other land uses. However, having these types of right-of-way facilities in close proximity to one another could make them, and the public that relies on them, more vulnerable to potential natural disasters.

Designating avoidance (75,626 acres) and exclusion (27,361 acres) areas would limit or exclude potential rights-of-way development in those areas. Issuance of any new land use authorizations in or near riparian areas would include special stipulations to protect riparian values.

New leases, permits, rights-of-way, and easements would be permitted in a manner consistent with meeting Land Health Standards and applicable BMPs, and the guidelines set forth in BLM's Wind Energy Development Programmatic EIS, June 2005.

Compared to Alternative A, implementation of any of the action alternatives would improve land ownership adjustment management and provide better guidance in achieving BLM land ownership goals by prioritizing actions which are associated with chronic management problems and protecting public resource values. High priority areas for retention and potential land acquisition would be associated with ACECs, Wild and Scenic Rivers, Wilderness Study Areas, National Trail Corridors, Special Recreation Management Areas, recreation sites, and habitat for priority and special status species. Under all action alternatives, specific land ownership adjustment criteria developed for retention, disposal and acquisition would be followed. These criteria are described in **Appendix L – Lands and Realty**.

Under all action alternatives, management actions would progress toward BLM access management goals by following guidance provided by the specific access criteria outlined in **Appendix L – Lands and Realty** for obtaining new access and managing existing access to BLM-administered lands. Implementation of the action alternatives would provide better guidance than Alternative A in terms of how and when access should be obtained.

Under all action alternatives, up to 8,901 acres of BLM land identified for disposal could potentially pass to private ownership and would no longer be subject to federal land management laws and policies.

Effects of Alternative B

Building and using new roads for long-term use for forest products would result in the need for BLM to obtain road access to forested areas through easement acquisition. Compared to the other alternatives, Alternative B would have a greater need for additional access for management of forest products than Alternative C, but likely less than Alternatives A and D.

Under this alternative, impacts to the Lands and Realty Program from the management of suitable Wild and Scenic Rivers segments (5.7 miles) to protect outstandingly remarkable values would be less than under Alternatives A and C, but greater than Alternative D.

Designation of four new ACECs and management actions to protect relevant and important resource values would restrict land use authorizations, land ownership adjustments, and access to public lands within the DA on approximately 70,644 acres. Compared to the other alternatives, ACEC management in Alternative B would have a greater impact on the Lands and Realty Program than with Alternatives A and D, but a lesser impact than Alternative C.

Alternative B would set the priority for new withdrawal proposals or other protective actions to developed recreation sites followed by new acquisitions, and ACECs to protect resources and values as needed.

In alternative B, approximately 198 acres at various developed recreation sites, would be recommended for withdrawal from mineral location. Designation of approximately 36,406 acres as closed to oil and gas leasing would eliminate the need for land use authorizations, withdrawals, or access for the purpose of oil and gas leasing on approximately 6 percent of BLM-managed federal mineral estate lands in the DA. With fewer acres closed to oil and gas leasing activities than under the other alternatives (except for Alternative D, which would close the same number of acres), Alternatives B and D would have the greatest potential need for land use authorizations, withdrawals, or access from oil and gas leasing in these areas.

Effects of Alternative C

By not building new roads for long-term use, the need for road access through easement acquisitions would be minimized. Compared to the other alternatives, Alternative C would have the least need for additional access for management of forest products.

Alternative C would allow for a similar number of withdrawn acres as Alternative B by setting the priority for new withdrawals to developed recreation sites followed by all new acquisitions through exchange or purchase, and in ACECs.

Under this alternative, impacts to the Lands and Realty Program from the management of suitable Wild and Scenic Rivers segments (12 miles) to protect outstandingly remarkable values would be the same as under Alternative A.

Designation of four new ACECs and management actions to protect relevant and important resource values on ACECs would restrict land use authorizations, land ownership adjustments, and access to public lands on approximately 87,892 acres of the DA. Compared to the other alternatives, ACEC management under Alternative C would potentially have the greatest impact on the Lands and Realty Program of all the alternatives.

Approximately 180 acres of land in riparian areas of the Muskrat Creek drainage, as well as approximately 198 acres at various developed recreation sites, would be recommended for withdrawal from mineral location in Alternative C.

Alternative C would designate 580,382 acres as closed to oil and gas leasing, more than any other alternative. This would eliminate the need for land use authorizations, withdrawals, or access for the purpose of oil and gas leasing on the greatest amount of acreage of any of the alternatives.

Effects of Alternative D

Allowing new roads for long-term use for forest products would result in the need for road access to forested areas in the form of road rights-of-way and road use agreements. Compared to the other action alternatives, Alternative D would have the greatest need for additional acres for access for management of forest products.

Like Alternative A, withdrawals from mineral entry would be pursued on a case-by-case basis.

Under this alternative no river segments would be recommended as suitable for inclusion in the National Wild and Scenic River System, and therefore would not be subject to restrictions on lands and realty actions for eligible river segments.

Designation of two new ACECs and management actions to protect relevant and important resource values on ACECs would restrict land use authorizations, land ownership adjustments, and access to public lands on approximately 23,695 acres of the DA. Compared to the other alternatives, Alternative D would potentially have a greater impact on the Lands and Realty Program than Alternative A, but a lesser impact than Alternatives B and C.

The greatest potential need for land use authorizations, withdrawals, or access from oil and gas leasing would be the same as in Alternative B.

SPECIAL DESIGNATIONS

Effects Common to All Alternatives

No impacts to special designation areas are anticipated from proposed management associated with special status and priority plants, air quality, soils, water quality, cultural resources and traditional cultural properties, paleontological resources, abandoned mine lands, hazardous materials, social and economic, prime farm lands, environmental justice, or Tribal treaty rights.

Actions emphasize monitoring the impact grazing has on meeting resource value standards, particularly for vegetation and water quality. This action would benefit the values of special designation areas since problems and corrective measures would be identified and potentially corrected in a timely manner.

Wildlife actions to improve habitat to stabilize or increase wildlife populations would indirectly enhance wildlife and vegetation resource values within established special designation areas.

Special designation areas with outstanding values associated with wildlife habitat or species diversity would be protected. Habitat management plans, conservation strategies and coordinating with other agencies to improve habitat within special designation areas would directly help retain or enhance vegetation, wildlife species, solitude, naturalness, and scenic values.

All existing special designation areas would be managed to prevent unnecessary and undue degradation to existing values and resource characteristics.

Effects Common to Action Alternatives

Vegetative treatment actions would focus on restoring the desired ecological conditions of special management areas and would occur to protect or enhance important resource values. Wildland fire management would concentrate on the enhancement and/or protection of special area values except in instances where private lands and structures are threatened. Active public outreach to educate visitors about noxious weeds and control efforts would have a positive effect on the vegetation and habitat values in ACECs, National Trail corridors, WSRs and WSAs.

The action alternatives would implement a variety of management actions designed to enhance the habitat conditions for special status and priority plant and animal species in the Decision Area, which would directly enhance the wildlife and habitat values of all special designation areas.

The protection and enhancement of riparian areas, native fisheries, and aquatic resources would have a positive impact on special designation areas and visitor experiences.

Travel management and access within the special designation areas would be limited to designated routes or closed to protect unique resource values and enhance primitive and unconfined recreation opportunities.

All lands within special management areas would be classified for future retention and acquisitions that enhance important values and their management would be given priority.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Effects Common to All Alternatives

Table 4-38 displays the acres of ACEC proposed by Alternative. ACECs located close to or within urban interface areas could be directly affected by wildland fire prevention and suppression activities designed to control the ignition and spread of wildland fires. Activities, such as mechanical or hand thinning, could damage the special characteristics of an ACEC. Fuels reduction treatments in the ACECs outside of the urban interface areas would emphasize prescribed burning; however,

these treatments would be designed to minimize or mitigate effects to values associated with special designation areas.

Activities to improve and maintain wildlife habitat would enhance wildlife and vegetation resource values in the ACECs.

Management would focus on conserving special status and priority species and implementing habitat improvement projects or recovery plans, which would benefit all ACECs by alternative.

The non-WSA portion of the Sleeping Giant ACEC would be managed as "Limited" to motorized use, which would continue to benefit the ACECs outstanding values while allowing vehicle access to walk-in trailheads.

Existing management would protect the relevant and important values of the Sleeping Giant ACEC.

Many ACECs would be managed as Class II areas and proposed projects would be subject to visual contrast ratings to ensure visual resource disturbances are not evident.

The Sleeping Giant and Humbug Spires and portions of the Elkhorn areas would be designated and managed as ACECs under all action alternatives.

Effects of Alternative A

The existing Sleeping Giant ACEC (11,679 acres) would continue to be managed under the current ACEC management plan (**Table 4-38**). No additional ACECs would be designated and therefore this alternative would provide the least protection of relevant and important resource values.

Effects of Alternative B

All potential ACECs would be managed as ACECs except Spokane Creek under Alternative B. This alternative would establish the second highest acreage of lands (70,644 acres) under ACEC designation and protection (**Table 4-38**). This alternative proposes one less ACEC area than Alternative C, and a smaller portion of the Elkhorns area would be designated under Alternative B.

Effects of Alternative C

Alternative C would designate all five potential areas and the most acres (approximately 87,893 acres) as ACECs of all alternatives (**Table 4-38**). This alternative would designate all of the land within the Elkhorns Wildlife Management Unit MOU in the Elkhorns ACEC and Spokane Creek. This alternative would provide the greatest protection for the identified relevant and important values associated with the ACEC review process.

Effects of Alternative D

Of all the action alternatives, Alternative D would manage the least amount of acreage as ACECs (23,695 acres) (**Table 4-38**). Three potential ACECs would be designated including Sleeping Giant, Elkhorns, and Humbug Spires. The Elkhorns ACEC boundary would be the same as the Elkhorns Tack-on WSA boundary, which is the lowest acreage managed in the Elkhorns ACEC compared to the other action alternatives.

Table 4-38
Acres of Potential ACECs and WSAs Designated in Each Alternative

Name	Total Acres			
	Alt A	Alt B	Alt C	Alt D
ACEC				
Sleeping Giant	11,679	11,679	11,679	11,679
Humbug Spires	-	8,374	8,374	8,374
Spokane Creek	-	-	14	-
Ringing Rocks	-	160	160	-
Elkhorns	-	50,431	67,665	3,575
Total Acres Managed as an ACEC	**11,679**	**70,644**	**87,892**	**23,628**
WSA				
Humbug Spires	11,320	11,320	11,320	11,320
Sleeping Giant	6,666	6,666	6,666	6,666
Sheep Creek	3,801	3,801	3,801	3,801
Black Sage	5,917	5,917	5,917	5,917
Elkhorn	3,575	3,575	3,575	3,575
Yellowstone River Island	69	69	69	69
Total Acres Managed as a WSA	**31,349**	**31,349**	**31,349**	**31,349**

Source: Alternatives Description, BLM Butte Field Office, 2005.

National Trails

Effects Common to All Alternatives

National Trail segments located close to or within urban interface areas could be directly affected by wildland fire prevention and suppression activities designed to control the ignition and spread of wildland fires.

Effects of Alternative A

No ROS or VRM designations or management plans would be created for the Continental Divide National Scenic Trail. The Lewis and Clark National Historic Trail would be managed in accordance with the Missouri River Comprehensive Recreation Management Plan. Most lands along this river would be managed as VRM Class II and no ROS designations would be allocated.

Lowest protection provided for the two National Trail corridors given that ROS, VRM, Travel and oil and gas restrictions would be lowest.

Effects of Alternative B

Alternative B offers the second highest protection for the National Trails as resource use restrictions would be greater than under Alternatives A and D.

Effects of Alternative C

This alternative offers the greatest protection of the existing National Trails and associated user experiences since all resource uses such as timber harvesting, motorized travel, rights-of-way, minerals, and oil and gas would be restricted the most through ROS, VRM, and travel management.

Effects of Alternative D

This alternative offers the second lowest protection for National Trails as potential impacts from other resource uses would be higher than Alternatives B and C.

Wild and Scenic Rivers

Effects Common to All Alternatives

Management would focus on conserving special status and priority species and implementing habitat improvement projects or recovery plans, which would benefit the Upper Big Hole River, Missouri River and Muskrat Creek WSRs where recommended as suitable by alternative.

Effects of Alternative A

The outstandingly remarkable values of all eligible Wild and Scenic river segments would be protected and would be negligibly-to-minimally impacted by management.

Effects of Alternative B

Under this alternative Muskrat Creek would be recommended suitable for inclusion in the National Wild and Scenic Rivers System. The Missouri River segment would be found preliminarily suitable pending Forest Service concurrence. The management of these two segments would not change from the existing management, as described under Alternative A. The Upper Big Hole River and Moose Creek would be identified as non-suitable for the National Wild and Scenic Rivers System, and protective management actions, regarding important resource values, would not continue. The Moose Creek segment would fall back to WSA and ACEC management as it is part of the Humbug Spires WSA (and potential ACEC) while the Upper Big Hole River would be managed as a Special Recreation Management Area under the Upper Big Hole River Management Plan.

Effects of Alternative C

All four of the Wild and Scenic River segments would be recommended as suitable for consideration in the National Wild and Scenic Rivers System; however, the interim management of these segments would be the same as in Alternative A to manage for their outstandingly remarkable values.

Effects of Alternative D

All four eligible Wild and Scenic River segments would be identified as non-suitable for inclusion into the National Wild and Scenic Rivers System. Management actions governing these river segments would not specifically protect outstandingly remarkable values so they would be subject to greater impacts than in the other alternatives.

Wilderness Study Areas

Effects Common to All Alternatives

Table 4-38 displays the acres of Wilderness Study Area proposed by alternative. There are no additional lands with wilderness characteristics in the Decision Area.

All six WSAs would be managed as they are currently, under the Interim Management Policy and Guidelines for Lands under Wilderness Review. This status may change if Congress designates the WSAs as wilderness or if they are removed from consideration. If a WSA becomes a wilderness area, a wilderness management plan would be created. If a WSA is removed from consideration, the area would no longer have legislative protection for the outstanding values. The Sleeping Giant and Sheep Creek WSAs would have fall back administrative protection since these areas would be designated and managed as ACECs under all alternatives.

Fire management activities would be conducted to avoid unnecessary impairment of each area's suitability for preservation as wilderness. Retardant, motorized equipment and earth disturbances would be restricted to the minimum necessary to protect human life and property. Priority would be given to locate large fire camps outside WSAs and to utilize fire crews to rehabilitate impacts prior to being released. These actions would benefit the preservation of the wilderness characteristics within the WSAs.

Pre-FLPMA grazing uses would be allowed to continue subject to unnecessary and undue degradation concerns while new livestock uses and developments would be restricted to actions that enhance wilderness values and satisfy the nonimpairment criteria. Prohibiting the removal of forest fiber products and vegetation conversions/manipulations; allowing noxious weed to be controlled; and limiting vegetative rehabilitation efforts to native species would prevent impacts to naturalness qualities and reduce impacts to visitors seeking wilderness related experiences.

Activities to improve and maintain wildlife habitat for native, priority, and special status species would be conducted subject to IMP guidelines. These efforts would enhance supplemental wildlife values and natural characteristics in the WSAs.

All WSAs would be closed to motorized travel except Black Sage and the southern portion of Humbug Spires which is limited to established routes. These restrictions enhance fisheries, wildlife, water quality, native vegetation, apparent naturalness, solitude, and primitive recreation values.

Opportunities for solitude and a variety of primitive and unconfined recreation experiences within WSAs would continue to be promoted. Recreational activities that do not meet nonimpairment criteria would generally be prohibited with the exception of motorized uses on established vehicle ways.

WSAs would be managed to achieve VRM Class I, which would directly preserve the naturalness and scenic qualities in each WSA.

All land use authorizations within WSAs would follow interim management policies and guidelines. Given that all new actions are subject to the nonimpairment standard, no wilderness character impacts are foreseeable. Land use authorizations relating to grandfathered and valid existing rights may disrupt natural processes and may cause negative impacts on outstanding values.

Oil and gas leasing and development would be prohibited in all WSAs subject to the rights of owners of non-BLM mineral estate. There are no known leases within the WSAs that have valid existing rights or grandfathered uses associated with them. Geothermal leasing would also be prohibited in all WSAs as no valid or grandfathered leases exist.

Locatable mineral activities would be subject to IMP protection within WSAs. Mineral activities within WSAs studied under Section 603 of FLPMA (Sleeping Giant, Humbug Spires, Black Sage, and the Yellowstone River Island) will be regulated to nonimpairment standards while Section 202 WSAs (Sheep Creek and the Elkhorns Tack-on) will be managed to prevent unnecessary and undue degradation. As a result valid mining claim activities pose greater potential risks for impacting the wilderness characteristics of these 202 WSAs.

Effects of Alternative A

All WSAs would continue to be managed under the Interim Management Policy and Guidelines and therefore wilderness values would continue to be protected, under the assumption that no Congressional action would occur.

Effects Common to Action Alternatives

All WSAs (Sleeping Giant, Sheep Creek, Humbug Spires, and Elkhorns Tack-on) except Black Sage and the Yellowstone River Island would be managed as ACECs under all action alternatives. These designations would provide long-term resource value protection should Congress remove these WSAs from further wilderness consideration or in the case of the Elkhorns Tack-on, should the adjoining Forest Service lands be dropped from wilderness consideration.

Black Sage and the Yellowstone River Island, if dropped from wilderness consideration, would be managed under varying fall back managing strategies under Alternatives B, C and D. Management prescriptions for these WSAs would address recreation, motorized travel, visual, minerals, and land ownership, which would aid in protecting their outstanding values (solitude, naturalness and primitive and unconfined recreation opportunities).

The Elkhorn Tack-on WSA would be dropped from further wilderness review, should the adjoining FS lands be released from wilderness consideration, as this small WSA is not capable of providing outstanding opportunities for solitude or primitive and unconfined recreation on its own. This action would not impose major impacts to the existing values of the area given the fall back ACEC designation.

Effects of Alternative B

Under this alternative fall back management for the Black Sage and the Yellowstone River Island would be less protective than under the IMP guidelines. Major changes in the management of Black Sage would be that existing roads could be re-routed; VRM would be managed as Class II; new Rights-of-Ways could be authorized; locatable minerals would be open subject to unnecessary and undue degradation; oil and gas entry would be allowed subject to big-game timing limitations from 12/1 to 6/30; all saleable and other leasable minerals would remain unavailable; and vegetative treatments

could be conducted provided they were done in a manner that restored or maintained natural processes. The effects of these management changes could impact natural qualities, solitude and primitive and unconfined recreation opportunities and supplemental value characteristics of this 5,917-acre area due to surface disturbances, visual modifications, increased vehicular travel, and noise intrusions.

Fall back management changes for the Yellowstone River Island would be less impacting since most resources and uses would be managed similar to IMP protection guidelines. The major differences would be that the VRM Class would change from I to II, locatable mineral entry would be open subject to unnecessary and undue degradation; and leasable minerals would be subject to No Surface Occupancy. Although the island would be open to locatable minerals, the probability for impacts to the island's wilderness characteristics would be minimal given its difficult accessibility issues, natural river barriers, and low desirability for mineral activity given the high operating and reclamation costs.

Effects of Alternative C

Fall back management for Black Sage and the Yellowstone River Island would be similar to Alternative B if dismissed from further wilderness consideration by Congress, with the exception of oil and gas. Oil and gas stipulations would be most restrictive of all alternatives in that no new leases would be issued. Impacts on wilderness characteristics would be less than Alternative B given the added restrictions on oil and gas activities.

Effects of Alternative D

For most land management activities in the Black Sage and Yellowstone River Island WSAs, management would be similar to Alternative B in the event that these areas were dismissed from further wilderness consideration by Congress. The major difference would be that the Black Sage WSA would be open to all salable and leasable minerals and oil and gas leases would have timing limitations from 12/1 to 5/15 for big game winter/spring range protection. These management changes would subject the area's wilderness characteristics to greater potential impact from mineral related activities. Impacts to the Yellowstone River Island could be slightly greater since the island would be available for land adjustment as well as salable and all leasable minerals under this alternative.

EFFECTS ON SOCIAL AND ECONOMIC CONDITIONS

ECONOMIC

Effects Common to All Alternatives

The economic analysis assesses the economic effects of the direct use of resources in terms of jobs and income. This type of analysis does not include other types of economic value that may be associated with unique natural resources and protected areas. These types of values, often referred to as non-market values, include natural amenities and quality of life, non-use values, bequest values, and ecosystem services.

Non-Market Values

Natural amenities and quality of life have been increasingly recognized as important factors in the economic prospects of many rural communities in the American West and elsewhere (Rudzitis and Johnson 2000). While natural amenities and life quality do not directly generate income in the same sense as, for example, a sawmill or a tourist lodge, they do act to attract and keep residents, and may attract new businesses. Open spaces, scenery, and protected lands are important to residents of Montana and throughout the Rocky Mountain west and may contribute to healthy economies and lifestyles (Sonoran Institute 2003). This relationship is, however, difficult to quantify as is assessing the effects of different management actions on the economic activities that these amenities are believed to indirectly generate. In this case, the impacts of the action alternatives relative to Alternative A are not expected to result in measurable changes in this type of indirect economic activity.

Non-Use Values

Non-use values, as the name might suggest, represent the value that individuals assign to a resource independent of the use of that resource. These types of values, which include existence, option, and bequest values, are usually measured via surveys that ask people how much they would be willing to pay to have a particular area preserved or designated as wilderness. These values represent the value that individuals obtain from knowing that a resource exists, knowing that it would be available to use in the future, and knowing that it would be left for future generations. Wilderness has been the subject of numerous non-use studies, usually conducted for specific natural areas, and willingness-to-pay estimates for protection or designation have identified a wide range of values (Krieger 2001; Loomis and Richardson 2001).

No attempt has been made to quantify potential non-use values associated with the RMP alternatives because none of the alternatives propose new wilderness that would significantly restrict current uses.

Based strictly on the number of acres that would be in an ACEC, Alternative C would likely have the highest wilderness and protected land-related non-use values. Alternative A would have the lowest values, followed by Alternative D.

Ecosystem Services

Ecosystem services may be defined as those natural processes that provide long-term life support benefits to society as a whole. Examples of these types of benefits include watershed processes, soil stabilization and ero-

sion control, improved air quality, climate regulation and carbon sequestration, and biological diversity (Krieger 2001).

No attempt has been made to assign monetary values to the ecosystem services that would be provided because these values are difficult to quantify at this analysis level. In addition to the difficulties involved in developing accurate estimates of these values, the impacts of project alternatives are rarely quantified in the type of units that would allow these values to be assigned. However, the fact that no monetary value is assigned to ecosystem services in this document does not lessen their importance in the decision making process.

The potentially affected local economy is characterized for the Planning Area counties in the Affected Environment portion of this document (Chapter 3). None of the alternatives would be expected to affect economic diversity (the number of economic sectors) or economic dependency, which occurs when the local economy is dominated by a limited number of industries. While the proposed alternatives have the potential to affect local businesses and individuals, as discussed in the following sections, the relative contribution of Butte Field Office-related activities to the local economy and the relative differences between the alternatives would not be large enough to have any measurable effect on economic diversity or dependency. This is also the case with respect to economic stability, which is typically assessed in terms of seasonal unemployment, sporadic population changes, and fluctuating income growth rates. Butte Field Office-related activities include logging and recreation, which are typically characterized by seasonal employment, but none of the alternatives would be expected to affect existing trends in these or other industries.

Wildland fuel treatment costs are included for the purposes of this analysis in the total BLM expenditures identified by alternative (**Table 4-39**). Projected fuel treatment costs range from approximately $400,000 under Alternative C to approximately $1.26 million under Alternative D. Other potential wildland fire-related costs (such as property loss, lost revenues, and increased suppression costs) are difficult to project and are unknown. It is commonly accepted that fire suppression costs and risk to life and property should be less on wildland fires that occur where hazardous fuels have been treated compared to areas where fuels have not been reduced. For example, fires generally burn hotter, flame length is higher, and fires in tree canopies are more likely in non-treated areas. A comparison of fire suppression costs in Western Montana and Eastern Montana help illustrate the differences in suppression costs.

Fire suppression costs incurred on the Beaverhead-Deerlodge, Gallatin, and Helena National Forests from 2000 through 2003 are summarized in (**Table 4-40**). These costs, presented as average suppression costs per acre, are provided to illustrate potential wildland fire suppression costs. The alternatives involve different approaches to, and levels of, vegetation treatment, as well as different approaches to wildland fire manage-

Table 4-39
Estimated Outputs by Alternative

Output	Current[1]	A	B	C	D
Actual Use Cattle (head month)[2]	31,200	31,200	28,300	28,800	31,200
Actual Use Sheep (head month)[2]	6,430	6,400	6,400	6,400	6,400
Estimated Timber Output (CCF) (PSQ)[3]	9,800	9,800	9,200	4,100	10,800
Dimension Stone (short tons)	N/A	400	400	400	400
Construction Sand and Gravel (short tons)	20,000	20,000	20,000	20,000	20,000
Limestone (short tons)	330,000	330,000	330,000	330,000	330,000
Natural Gas (M Cubic Feet)	0	980,000	980,000	0	980,000
General Recreation (1000 visits)	897	897	889	882	894
Fish and Wildlife Recreation (1000 visits)	437	437	426	417	434
BLM Expenditures ($000,000s)	3.7	3.7	4.2	3.5	5.0

[1] Estimates include actual use levels (recreation visits in 2004) and authorized amounts (grazing and timber). Data are not available for minerals.

[2] Data, including the current estimate, are based on head months available for activation. Actual use has averaged about 70 percent of the total over the past seven years. 1 head month of cattle and horses = approximately 0.78 AUMs for cattle and horses; 1 head month for sheep and goats = approximately 0.2 AUMs for sheep and goats.

[3] Sawtimber data, including the current estimate, are based on the Probable Sale Quantity (PSQ). Actual sawtimber harvest was approximately 21 percent of the PSQ in 2003.

ment. This would tend to reduce the threat to life and property. Across all fire size class categories, the fire suppression costs per acre for the Custer NF were about one-fourth the average of the cost over the other three forests. It is not, however, possible to project the level of non-prescribed wildland fire that would occur under any of the alternatives. Based on the level of hazardous fuels treatments for each alternative, total wildland fire suppression costs for fires in the Butte Field Office would be highest for Alternative C and lowest for Alternative D.

This section discusses impacts to potentially affected groups that are unlikely to vary substantially by alternative.

Timber and Forest Product Production

The local primary forest product industry described by the Bureau of Business and Economic Research (BBER, 2001) is a long standing and basic industry that all of the alternatives would continue to supply with traditional materials shown in the PSQ estimates. The alternatives provide for changes that are anticipated through industrial research and development, and through entry of new businesses in the field, offering a different assortment of products such as biomass, that would use non-traditional and currently low value forest materials that were utilized inefficiently or were often considered to be waste in the past. While the harvest amounts being proposed under all of the alternatives would not have a significant effect on the total amount of material available from all ownerships in the area, they are still important, as the current timber harvest levels in Montana are considered to be insufficient to sustain the current industry for the next decade (BBER, 2004).

The commercial treatments proposed would tend to reduce the intensity of wildfire events and the tree conditions that favor development of epidemic levels of forest insect or disease. These treatments are expected to reduce the severe levels of tree mortality and site damage that are experienced during such large scale, stand replacement events, and would reduce the amount of salvage volume available from such events in the future. The intended reductions in the severity from such events would also tend to insure a steady and continuing supply of future forest products, helping to sustain economic conditions and improving local acceptance of active forest management and forest product removals.

Each of the alternatives also would sustain current local government revenues from the product sales within the eight-county area, as four percent of non-stewardship timber receipts are returned through the state to the counties where they are generated.

Ranching

Livestock grazing on BLM-managed land in the eight-county Planning Area would continue to involve approximately the same number of operators. Less than seven percent of the farms and ranches in the Planning Area would hold BLM grazing permits. The amount of livestock grazing would change less than 10 percent among the alternatives and BLM would continue to provide less than one percent of the total forage needed to feed livestock in the Planning Area (AMS, Appendix P (USDI-BLM 2006c)). The economic dependency of livestock producers on BLM forage would remain unchanged. However, often BLM forage would continue to provide a critical element of some livestock producers' complement of grazing, forage, and hay production. Farm income would continue to account for approximately one percent of total income in the eight-county study area.

Table 4-40
Fire Suppression Average Acre Cost by Fire Size Class

	Fire Size Class[1, 2]						
National Forest	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Beaverhead-Deerlodge	14,667	5,913	2,387	1,435	519	808	340
Custer	8,938	1,156	305	206	264	462	39
Gallatin	15,033	8,136	4,264	4,150	2,881	1,245	411
Helena	8,668	2,500	2,049	N/A	N/A	N/A	120
Average	12,789	5,516	2,900	2,793	1,700	1,027	290

[1]Fire size class is defined as follows:

A	0.01 acres to 0.25 acres	E	300.00 acres to 999.90 acres
B	0.26 acres to 9.90 acres	F	1,000.00 acres to 4,999.90 acres
C	10.00 acres to 99.90 acres	G	5,000.00 acres and larger
D	100.00 acres to 299.90 acres		

[2]Data are from the Forest Service which manages fire suppression in the Planning Area.

Source: Region 1 (FS) Fire Suppression Average Acre Cost by Unit. Derived from individual S100-2 reports 2000-2003.

Recreation Use, Permitted Outfitters and Guides

None of the proposed alternatives would be expected to affect current outfitter and guide use. The action alternatives do vary in terms of fee collections for commercial fishing and floating outfitters who use developed BLM river access sites. Payment of these fees would have different administrative impacts, but the actual costs would likely be passed on to the clients. Outfitters and guides would continue to have the same opportunities under all alternatives as they currently do, with the exception of potential hunting outfitter and guides who would not be able to camp at developed fee sites during hunting season under Alternatives B and C. There are currently no commercial outfitter and guides using developed fee sites during hunting season.

Revenues from recreation use permits, campground receipts, and outfitter and guide receipts would be similar (approximately $123,000 per year) for all alternatives.

Lands and Realty

Use authorizations, e.g., rights-of-way, permits, and lease rentals would continue to generate an estimated $110,000 of revenue annually for the federal government. Payments in Lieu of Taxes (PILT) from the federal government to the eight counties would continue to be approximately $5.1 million with all the alternatives.

Other Impacts

Under all alternatives, economic diversity indicated by the number of economic sectors would remain relatively unchanged, though shifts in emphasis could occur. Estimated costs to local governments would also remain unchanged, i.e. demand for services and infrastructure would not change.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations. The Order further stipulates that agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

None of the proposed alternatives would be expected to have disproportionately high and adverse human health or environmental effects on minority and low income populations. All four alternatives are expected to result in increases in employment and labor income over the next decade, with alternatives resulting in a very small share of total employment within the eight counties that comprise the Planning Area.

Public involvement efforts for this project have been inclusive and the agency has considered input from persons or groups regardless of race, color, national origin, income, or other social and economic characteristics.

Public Health and Safety

Under all alternatives, the hazardous materials management program focuses on immediate and urgent threats to human health and the environment from spills, releases, dumping, and discovery of hazardous waste sites. In terms of health and safety, land use authorizations for uses which would involve the disposal or storage of materials which could contaminate the land would not be issued. Lands proposed for acquisition or disposal would need to be inventoried for the presence of hazardous materials. The presence of contaminants may lead to actions such as the modification or abandonment of a land ownership adjustment proposal, or remediation in the form of cleanup and removal of the contaminants. Standard operating procedures required under the National Oil and Hazardous Substances Pollution Contingency Plan would be implemented during cleanup.

There would be no effects to public health and safety from proposed management associated with vegetation communities, special status and priority plant and animal species, recreation, ACECs, air quality, soils, water, paleontological resources, energy and minerals, environmental justice or tribal treaty rights.

Under all alternatives, abandoned mines that pose a significant risk to human health and the environment would be remediated.

Abandoned mine land (AML) reclamation prioritization would enable BLM to address immediate problem sites that pose a threat to public health and safety.

Reclamation activities conducted in accordance with Land Health Standards would contribute to achievement of the resource use vision statement.

Monitoring AML sites after reclamation would reduce risk to public safety by clarifying where risk to public health and safety has been reduced as well as where risks still exist.

Effects of Alternative A

Economic Environment

Estimates of the levels of employment and labor income that would be supported by Alternative A are based on projected resource outputs and projected BLM expenditure levels (**Table 4-39**). Estimated average annual employment and labor income are summarized by resource area in **Table 4-42** and **Table 4-41**, respectively.

Table 4-42
Average Annual Employment by Program by Alternative (Full- and Part-time Jobs)

Resource	Current	A	B	C	D
Recreation	510	510	506	502	508
Wildlife and Fish	292	292	285	278	290
Grazing	11	11	10	11	11
Timber	106	106	99	45	117
Minerals	D	92	92	D	92
Ecosystem Restoration	10	10	18	6	23
Payment to State/Counties	144	157	157	144	157
BLM Expenditures	89	89	92	87	99
Total Field Office Management	1,193	1,266	1,259	1,104	1,297
Percent Change from Current	---	**6.1**	**5.5**	**-7.5**	**8.7**

D = Data withheld to avoid disclosing confidential data of individual firms Source: FEAST 2007.

Table 4-41
Average Annual Labor Income by Program by Alternative (Thousands of 2006 dollars)

Resource	Current	A	B	C	D
Recreation	$13,073.6	$13,073.6	$12,960.5	$12,860.7	$13,030.4
Wildlife and Fish	$7,549.9	$7,549.9	$7,373.3	$7,206.7	$7,498.8
Grazing	$197.9	$197.9	$180.1	$183.0	$197.9
Timber	$2,999.9	$2,999.9	$2,816.4	$1,269.8	$3,312.9
Minerals	D	$4,592.3	$4,592.3	D	$4,592.3
Ecosystem Restoration	$335.6	$335.6	$585.4	$248.2	$746.6
Payments to State/Counties	$5,563.3	$6,064.9	$6,064.9	$5,563.3	$6,064.9
BLM Expenditures	$2,887.8	$2,887.8	$3,217.2	$2,699.5	$3,871.4
Total Field Office Management	$33,898.5	$37,701.8	$37,790.1	$31,321.8	$39,315.2
Percent Change from Current	---	**11.2**	**11.5**	**-7.6**	**16.0**

D = Data withheld to avoid disclosing confidential data of individual firms. Source: FEAST2007

Alternative A would allow an average annual harvest of approximately 9,800 CCF of timber (**Table 4-39**). The majority of this estimate (9,700 CCF) is based on the sawtimber PSQ and reflects the annual volume that would be available rather than actual harvest projections. Actual sawtimber harvest was approximately 21 percent of the PSQ in 2003. The remainder of the harvest estimate consists of fuel wood (61CCF) and post and poles (5.5 CCF). This harvest, if it were to occur, would support approximately 110 jobs and $3.0 million in labor income (**Table 4-42** and **Table 4-41**) within the local or regional economy.

Alternative A would continue current levels of forest product offerings and provide no adjustment in current economic condition.

Alternative A would authorize average annual grazing of approximately 31,200 cattle head months (HMs) and 6,400 sheep HMs (**Table 4-39**) and support about 10 jobs and $200,000 in labor income (**Table 4-42** and **Table 4-41**). Annual revenues from grazing permits would amount to approximately $35,000 (25,677 AUMs x $1.35/AUM= $34,664). Approximately 64 percent of the AUMs sold within the Butte Field Office are section 3 permits of which 12.5 percent of revenues are distributed to the state and local counties; 36 percent of the

AUMs are section 15 permits of which 50 percent of revenues are distributed to state and local counties. Total consumer surplus associated with 25,677 BLM AUMs would continue to be approximately $376,000. Annual federal revenues from livestock grazing would be about $35,000, of which about $8,400 would be distributed to the state and counties.

Recreation is the largest program managed by the Butte Field Office. It is estimated that recreation, including fish and wildlife-related recreation activities, would account for about 60 percent of all the jobs and about 50 percent of all the labor income that would be supported by Butte Field Office activities (**Table 4-42** and **Table 4-41**). Motorized access and motorized recreation opportunities would not change from the current condition. An annual average of approximately 900,000 general recreation visits and 440,000 fish and wildlife-related recreation visits are projected under Alternative A (**Table 4-39**). Alternative A would support approximately 800 jobs and $21 million in labor income (**Table 4-42** and **Table 4-41**). Annual federal revenues from recreation management (including user fees and partnership donations for site maintenance and improvements) would be about $123,000.

Currently, no oil and gas operations occur on federal lands/minerals. About 36,200 acres of federal minerals are currently leased within the planning area. Although acres available for oil and gas leasing would vary among alternatives, for this analysis the number of acres that would be leased under Alternative A, B, and D is projected to be about 37,700 acres. (37,731 acres are currently suspended with nominations. These would be available for lease upon completion of the RMP under alternatives A, B, and D.) Federal revenues from oil and gas leasing would include one-time lease bids (minimum of $2.00/acre), and annual rental fees on leases ($1.50 per acre/year for the first five years and $2.00 per acre/year each year thereafter). Currently, 36,243 acres are leased and generate about $72,000 in rental revenues. If all the new acres with suspended nominations were leased in one year the one-time lease bid would be at least $75,000. Annual lease rentals for the first five years of these new leases would be about $56,000. After the first five years, annual lease rentals (current and new) would be about $148,000. Total State lease revenue would be 50 percent of Federal lease revenues. This would amount to about $74,000 annually. At the scale of development projected, employment and income impacts on local residents would be limited and temporary. For analysis purposes, it is assumed that not more than one exploratory well would be drilled per year. Drilling would employ 15-20 workers per well for periods of up to 300 days. Average income per job in the mining sector would be about $49,000 per year (average for the State of Montana, 2000, Northwest Economic Association). However, since drilling would likely be undertaken by outside firms, much of the employment and income effects would not show up in the local economy. Gas production would contribute to state and local government revenues through oil and gas tax revenues. For analysis purposes it is assumed that 980,000 MCF of natural gas would be produced annually. This would generate an estimated $813,000 in Federal royalties (based on a six month average price of natural gas at wellhead of $6.64/MCF, Energy Information Administration, 10/11/07); one half (approximately $407,000) would be distributed to the State of Montana; and 12.5 percent of the state portion (about $102,000) would be distributed to the county or counties of production.

Alternative A would result in the estimated average annual production of 980,000 MCF of natural gas, 330,000 short tons of limestone, 400 short tons of dimension stone and 20,000 short tons of construction sand and gravel from public lands and federal minerals (**Table 4-39**). It is estimated that minerals exploration, development, and production on public lands/federal minerals would support about 90-100 local jobs and an estimated $4.6 million in local labor income. (**Table 4-42** and **Table 4-41**)

Annual average level of activities associated with ecosystem restoration would include fuels treatments and pre-commercial thinning (1,275 acres), weed spraying (2,000 acres), and road closures (172 miles). These activities would support about 10 jobs and $340,000 in labor income. BLM expenditures include both expenditures for employee salaries and other non-salary expenditures related to Butte Field Office operations. Non-salary expenditures are purchases made in support of resource programs and operations and include items such as contracts, gasoline, diesel, ammunition and explosives, animal feed, computer equipment, and so on. Budget expenditures by program would remain constant under Alternative A and would continue to support approximately 90 jobs and $2.9 million in labor income (**Table 4-42** and **Table 4-41**).

In conclusion, the estimated total (direct, indirect, and induced) number of local jobs and associated local labor income contributed by BLM land and resource management would be about 1,270 jobs and $38 million, respectively. Total employment and labor income generated by BLM resource management would increase by about 6 percent and 11 percent, respectively, compared to current management. These BLM-related contributions, i.e. jobs and labor income, would continue to be less than one percent of total within the local economy. The largest employment and labor income effects would occur in the accommodations and food services, government, and retail trade industry sectors (FEAST, 2007). All program revenues to the federal government would be about $1.1 million per year. Annual payments to the State of Montana and to counties would be approximately $5.5 million, most of which would be PILT payments. The dependency of the local economy on livestock industry, timber production, mining, oil and gas exploration, and recreation activities would not be affected by BLM resource management. The influence of resource management on BLM-administered lands would not change local economic diversity (as indicated by the number of economic sectors), dependency (i.e. where one or a few industries dominate the economy), or stability (as indicated by seasonal unemployment, sporadic population changes, and fluctuating income rates).

Social Environment

The following social analysis assesses the potential effects of different management actions on potentially affected social groups. These groups were identified based on past studies in and around the Planning Area and the results of public scoping conducted for the Butte RMP. The analysis addresses the potential impacts of the alternatives based on the issues and concerns raised by these groups during the public scoping process.

Timber employment is concentrated in only a few areas in the analysis area and lands managed by the Butte Field Office account for a very small portion of total harvest in this area. There would be no change in available timber harvest opportunities under this alternative. Public access and the availability of firewood and other forest resources would also remain unchanged. As a result, this alternative would be unlikely to affect current social conditions with respect to forest products. Timber-related issues, raised during public scoping for this project included concerns regarding noxious weeds, fuel hazard reduction, and dead tree salvage. The action alternatives, with the possible exception of Alternative C, would treat larger areas of weeds and based on this issue, Alternative A is likely to be less favored among those concerned about noxious weed treatments.

Fire suppression within the first burning period would limit the loss of forest products to fire. Wildland fire use and prescribed burning could cause a loss of forest products, but could also create salvage opportunities. Heavily stocked tree conditions contribute to epidemic levels of forest insect or disease and increase the intensity of wildfire events. Commercial treatments would reduce heavily stocked conditions and corresponding severe levels of tree mortality and site damage. Local acceptance of active forest management and forest product removals would likely be improved as the threat of intensive wildfire and the threat of forest mortality from disease and insects is reduced.

Lands managed by the Butte Field Office accounted for less than one percent of the total AUMs in the Planning Area in 2003, ranging from 0.02 percent of total AUMs in Broadwater County to 2.7 percent of the total in Jefferson County. These lands do, however, account for more than one-third of total AUMs for approximately 20 of the 174 existing ranchers who use Butte Field Office lands. In addition, these lands may be important to operators because of their relatively low grazing fees, which are $1.35 per AUM for 2007.

There would be no change in the authorized AUMs under Alternative A (**Table 4-39**). Conflicts between livestock grazing and wheeled vehicles would continue under this alternative. A wide range of recreation opportunities are available within the Planning Area. These activities involve diverse groups of people and changes in recreation management can affect people who engage in particular recreation activities very differently. Concerns were expressed during the public scoping process that demand for motorized recreational access has increased in recent years, while motorized access has decreased, largely as a result of federal land management action and policies that favor non-motorized users. Some commenting felt that public lands should be available to all users, both motorized and non-motorized, but some areas and trails should have limited types of use (hiking use only or OHV use only) where different types of use tend to be incompatible. Others felt that non-motorized uses are presently favored over motorized uses and felt that this balance should be changed, with motorized users allowed equal access (USDI-BLM 2005a).

Alternative A would not allocate ROS classes and recreation opportunities on Decision Area lands would continue to be managed under site-specific plans only. Management would continue to be challenging around developed recreation sites during peak recreation use seasons, particularly near shorelines and water-based recreation opportunities. Motorized access and motorized recreational opportunities (including organized motorized events) would continue unchanged under this alternative. As a result, this alternative would not address concerns about conflicts between motorized and non-motorized use or, between motorized use and livestock grazing. It would also not address concerns that the Butte Field Office should provide additional motorized recreation opportunities.

Permit requests by outfitter/guide hunters would be considered on a case-by-case basis throughout the decision area subject to environmental, social, and public health and safety concerns. No fees would be charged for commercial fishing and floating outfitters using developed BLM river access sites. This alternative would likely be favored by outfitter/guides over Alternatives B and C, which would impose constraints on potential outfitter/guide activities.

A number of individuals and organizations commenting during scoping for this project expressed concern about resource protection issues, with particular emphasis placed on wildlife, fisheries, water, and special area designations. Comments included requests that habitat corridors for threatened, endangered, and sensitive species and the integrity and non-motorized character of all roadless areas be maintained. Some respondents identified areas for designation as special use areas, including ACECs, wild and scenic river areas, and recreational river areas (USDI-BLM 2005a).

The current levels, methods, and mix of multiple use management would continue on Decision Area lands under this alternative and activity-level wildlife habitat and riparian protection measures would be less restrictive under this alternative than they would be under Alternatives B and C. The four eligible Wild and Scenic River segments would continue to be managed to protect the values that make them eligible and the six existing

WSAs would continue to be managed under the Interim Management Policy and Guidelines. No new ACECs would be established under this alternative. Based on these criteria, individuals and groups who give high priority to resource protection would be less likely to support this alternative than they would Alternatives B and C.

A number of individuals and groups expressed concern about limitations being placed on the availability of public lands for commercial uses such as livestock grazing, mineral development, and timber harvest. These people believe that local communities depend on these industries, which are a primary source of high paying jobs to local economies. Comments received during scoping for this project requested that the RMP revision focus on beneficial economic and social use of public lands, not locking them up from development or public access.

The current levels, methods, and mix of multiple use management would continue on Decision Area lands under this alternative. Resource outputs and current levels of motorized access and motorized recreation opportunities would not change under this alternative. Individuals and groups concerned about resource use limitations would likely favor this alternative or Alternative D.

Effects Common to Action Alternatives

Social Environment

ROS classes would be established and used to manage for desired recreation opportunities, experience levels, facility developments, and other resource uses. Implementation plans for Special Recreation Management Areas delineated Recreation Management Zones would be developed where specific management, marketing, monitoring, and administrative guidance is needed. The greatest difference between the action alternatives is the variation between motorized and non-motorized access.

Alternatives B and C would have the overall effect of reducing opportunities available for motorized recreation when compared to Alternative A, but the quality of the experience may increase because separating uses would reduce conflicts between user groups. Allocating areas to non-motorized use lets both non-motorized and motorized users know which areas they would have access to in the future.

Localized impacts from changes in management direction would be most likely to occur in the Scratchgravel Hills area, which would be managed differently under the action alternatives.

Public Health and Safety

In addition to impacts described under Effects Common to All Alternatives, Alternatives B, C and D would include the AML reclamation program requiring an abandoned mine shaft in the Ringing Rocks Potential ACEC to be reclaimed. The physical safety hazard for this site would be reduced.

Effects of Alternative B

Economic Environment

Estimates of the levels of employment and labor income that would be supported by Alternative B are based on projected resource outputs and projected BLM expenditure levels (**Table 4-39**). Estimated average annual employment and labor income are summarized by resource area in (**Table 4-42** and **Table 4-41**), respectively. The projected outputs and estimated employment and labor income are discussed by resource in the following sections.

Alternative B would provide for an average annual harvest of approximately 9,200 CCF of timber (**Table 4-39**). The majority of this estimate (9,100 CCF) is based on the sawtimber PSQ and reflects the annual volume that would be available rather than actual harvest projections. Estimated sawtimber harvest (9,100 CCF) would be approximately 99 percent of the PSQ. The remainder of the harvest estimate would consist of fuel wood (82 CCF) and post and poles (7.7 CCF). This harvest, if it were to occur, would support approximately 100 jobs and $2.8 million in labor income (**Table 4-42** and **Table 4-41**).

Alternative B would cause slightly smaller levels of forest product offerings with higher levels of acreage treatments. These changes would not have noticeable difference in economic conditions locally.

Alternative B would authorize average annual grazing of approximately 28,300 cattle HMs and 6,400 sheep HMs (**Table 4-39**) and support approximately 10 jobs and $180,000 in labor income (**Table 4-42** and **Table 4-41**). Annual revenues from grazing permits would amount to less than $32,000. (24,710 AUMs x $1.35/AUM= $31,587). Estimated total distribution to state and local counties would be about $7,600. Total consumer surplus associated with 24,710 BLM AUMs would be about $362,000. Annual federal revenues from livestock grazing would be about $31,600 and the amount distributed to the state and counties would be about $7,600. Alternative B emphasizes a balance of motorized and non-motorized recreation and access opportunities compared to the other action alternatives (Alternatives C and D). The number of recreation visits to Butte Field Office-managed areas is expected to increase at a rate of two percent per year over the next 10 years under all of the alternatives. The projected average annual visits summarized for Alternative B in **Table 4-39** were estimated based on this expected increase. The total number of visits projected under Alternative B is expected to be slightly lower than under Alternative A.

Management actions under Alternative B are projected to result in a relative reduction in the number of visits associated with motorized vehicle travel, hunt-

ing/archery, wildlife/natural viewing, and snowmobiling, and a relative increase in non-motorized recreation visits (e.g., foot travel, biking, and horseback riding) (**Table 4-39**). Annual federal revenues from recreation management would be about the same as with Alternative A ($123,000).

An annual average of approximately 889,000 general recreation visits and 426,000 fish and wildlife-related recreation visits are projected under Alternative B (**Table 4-39**). These visits would support approximately 790 jobs and $20.3 million in labor income (**Table 4-42** and **Table 4-41**).

The economic impacts associated with minerals management and operations would be similar to those described for Alternative A. (**Table 4-42** and **Table 4-41**). Indirectly, Alternative B would likely provide an environment that is more conducive to continuing long-term population growth and corresponding economic growth than Alternatives A and D because it offers more protection of public lands and resources through the management of ACECs, Wild and Scenic Rivers, travel management restrictions, and semi-primitive non-motorized recreation management. Studies indicate that "protected public lands, set aside for their wildland characteristics, can and do play an important role in stimulating economic growth..." (Prosperity in the 21st Century West, Rasker et al, 2004).

Estimated annual average level of activities associated with ecosystem restoration would include hazardous fuels treatments and pre-commercial thinning (2,560 acres), weed spraying (2,900 acres), road decommissioning (5 miles), and road closures (318 miles). These activities would support about 20 jobs and $590,000 in labor income.

In conclusion, the economic effects of Alternative B would be very similar to those of Alternative A. The estimated total (direct, indirect, and induced) number of local jobs and associated local labor income contributed by BLM land and resource management described above in Alternative B would be about 1,260 jobs and $38 million, respectively. Like Alternative A, total employment and labor income generated by BLM resource management under Alternative B would increase by about 6 percent and 11 percent, respectively, compared to current management. These BLM-related contributions, i.e. jobs and labor income, would continue to be less than one percent of total within the local economy. The largest employment and labor income effects would occur in the accommodations and food services, government, and retail trade industry sectors. All program revenues to the federal government would be about $1.1 million per year. Annual payments to the State of Montana and to counties would be approximately $5.53 million, most of which would be PILT payments. The dependency of the local economy on livestock industry, timber production, mining, oil and gas exploration, and recreation activities would not be affected by BLM resource management. The influence of resource management on BLM-administered lands would not change local economic diversity (as indicated by the number of economic sectors), dependency (i.e. where one or a few industries dominate the economy), or stability (as indicated by seasonal unemployment, sporadic population changes, and fluctuating income rates).

Social Environment

Projected timber harvest levels under Alternative B are slightly lower than current levels. Access to firewood, Christmas trees and other forest resources would be reduced under this alternative due in part to a 34 percent reduction in the roads currently available for public use to remove such materials and a 17 percent reduction in the forest and woodland area available under Alternative A through Recreational Opportunity Spectrum designation as Semi-primitive non-motorized where in some cases currently open roads would be closed. Access reductions would be greater than under current conditions, but lower than they would be under Alternative C.

An estimated 21,000 to 50,000 acres of weeds would be treated each decade under Alternative B. This may be slightly more to over twice the estimated 20,000 acres that would be treated under Alternative A. As a result, Alternative B would likely be relatively favored by those primarily concerned with noxious weed issues. Fire management impacts would be similar to those projected under Alternative A. Timber salvage would produce sawlogs and other timber products, but salvage would be more limited under this alternative than it would be under Alternatives A and D.

The numbers of AUMs permitted for livestock would be slightly less than for Alternative A; this decrease is not expected to affect any ongoing operation.

The effects to ranching would be the same under this alternative as they would under Alternative A. Relinquished allotments would be evaluated for suburban/urban interface issues, critical wildlife habitat, riparian values, or recreational considerations before being re-offered for permit or lease. Fewer conflicts between livestock grazing and wheeled vehicles would occur under this alternative than under Alternative A.

Alternative B emphasizes a balance of motorized and non-motorized recreation and access opportunities compared to the other action alternatives (Alternatives C and D); with 34 percent of Decision Area lands allocated to semi-primitive ROS classes. Management actions under this alternative are expected to result in a relative reduction in the number of visits associated with motorized vehicle travel, hunting/archery, motorized wildlife /scenery viewing, and snowmobiling, and a relative increase in non-motorized recreation visits (e.g., foot travel, biking, and horseback riding) (**Table 4-39**). Organized motorized events would be limited to the Pipestone area unless being held in conjunction with adjacent public or private lands. With the exception of a few

routes needed for residential access, the entire Scratchgravel Hills area would be closed to wheeled motorized vehicle use yearlong. This alternative would address concerns about conflicts between non-motorized and motorized use and between motorized use and livestock grazing. It would not address concerns that the Butte Field Office should provide additional motorized recreation activities.

Annual day-use fees (to be established in accordance with FLREA) per commercial guided boat would be charged for commercial fishing and floating outfitters using developed BLM river access sites. Payment would be collected at the time of use. Commercial camping permits within developed fee sites would not be allowed during the fee season (Memorial Day to Labor Day). Special Recreation Use Permits during the hunting season would be limited to day-use activities with the exception that camping uses would be considered within developed recreation sites during the non-fee season. Based on these constraints, commercial outfitter/guides would be less likely to favor this alternative than they would Alternatives A or D.

This alternative emphasizes moderate levels of resource protection, use, and restoration, with project-level wildlife habitat and riparian protection measures greater than under Alternatives A and D, but less than under Alternative C. Individuals and groups who give high priority to resource protection would be more likely to favor this alternative than Alternatives A and D.

This alternative emphasizes moderate levels of resource protection, use, and restoration. Estimated average annual timber harvest would be higher under this alternative than under Alternative C, approximately the same as under Alternative A, but less than under Alternative D (**Table 4-39**). Oil and gas leasing constraints would be more restrictive than under Alternatives A and D, but less restrictive than under Alternative C. Based on these criteria, individuals and groups who give high priority to resource use would be more likely to favor this alternative than Alternative C and possibly Alternative A, depending on the specific priorities of the group or individuals concerned.

Effects of Alternative C

Economic Environment

Estimates of the levels of employment and labor income that would be supported by Alternative C are based on projected resource outputs and projected BLM expenditure levels (**Table 4-39**). Estimated average annual employment and labor income are summarized by resource area in **Table 4-42** and **Table 4-41**, respectively. The projected outputs and estimated employment and labor income are discussed by resource in the following sections.

Alternative C would provide for an average annual harvest of approximately 4,100 CCF of timber (**Table 4-39**). This is lower than under current conditions and lower than the other alternatives. The majority of this estimate is based on the sawtimber PSQ and reflects the annual volume that would be available rather than actual harvest projections. This harvest, if it were to occur, would support approximately 50 jobs and $1.3 million in labor income (**Table 4-42** and **Table 4-41**). The local employment and labor income supported by timber harvest on BLM lands would be less than half of current levels.

This alternative would authorize average annual grazing of approximately 28,800 cattle HMs and 6,400 sheep HMs (**Table 4-39**) and support approximately 10 jobs and $183,000 in labor income (**Table 4-42** and **Table 4-41**). Economic effects of and permittee responses to grazing management would be similar to those described for Alternatives A and B. Annual revenues from grazing permits would similar to Alternative B (about $32,100), (24,710 AUMs x $1.35/AUM=$32,095). Estimated total distribution to state and local counties would be about $7,700. Total producer surplus would be about $362,000. The total number of visits projected under Alternative C is the lowest of the four alternatives. Management actions under Alternative C are projected to result in a relative reduction in the number of visits associated with motorized vehicle travel, hunting/archery, wildlife/natural viewing, and snowmobiling. Projected reductions in these areas would be twice as large as those under Alternative B but still relatively minor when measured in terms of regional economic impacts. Alternative C is also expected to result in a relative increase in non-motorized recreation visits (e.g., foot travel, biking, horseback riding, and non-motorized boating).

An annual average of approximately 882,000 general recreation visits and 417,000 fish and wildlife-related recreation visits are projected under Alternative C (**Table 4-39**). This increase over the current (2004) level of visitation is due to the baseline increase in recreation visits (two percent per year) that is projected under all of the alternatives. Alternative C would support approximately 780 jobs and $20.1 million in labor income (**Table 4-42** and **Table 4-41**). Annual federal revenues from recreation management would be about the same as with Alternative A because the increase in recreation use would occur largely in dispersed recreation use where BLM does not collect fees. Alternative C would result in the estimated average annual production of 330,000 short tons of limestone, 400 short tons of dimension stone, and 20,000 short tons of construction sand and gravel from public lands (**Table 4-39**). It is estimated that minerals exploration, development, and production on public lands/federal minerals would support about the same level of employment and labor income as current management. However, there would likely be no contribution from oil and gas leasing from BLM mineral estate lands due to the high degree of leasing restrictions under this alternative.

Estimated annual average level of activities associated with ecosystem restoration would include hazardous fuels treatments and pre-commercial thinning (450 acres), weed spraying (2,200 acres), road decommissioning (5 miles), and road closures (375 miles). These activities would support less than 10 jobs and about $250,000 in labor income.

BLM budget expenditures would be lower under Alternative C than under any other alternative, including Alternative A, No Action (**Table 4-39**). Alternative C would have lower expenditures than Alternative A in the range, fuels, and weed treatment programs, with the largest reduction occurring under the fuels program. BLM expenditures under this alternative would support approximately 90 jobs and $2.7 million in labor income (**Table 4-42** and **Table 4-41**).

Indirectly, Alternative C would provide an environment that would be more likely to sustain long-term population growth and corresponding economic growth than the other alternatives because it offers the most protection of public lands and resources through the management of ACECs, Wild and Scenic Rivers, travel management restrictions, semi-primitive non-motorized recreation management, and less mineral development. Studies indicate that "protected public lands, set aside for their wildland characteristics, can and do play an important role in stimulating economic growth..." (Prosperity in the 21st Century West, Rasker et al, 2004).

In conclusion, Alternative C is the only alternative analyzed in detail that would result in a short-term loss of local employment and labor income. The estimated total (direct, indirect, and induced) number of local jobs and associated local labor income contributed by BLM land and resource management described above in Alternative C would be about 1,100 jobs and about $31.3 million, respectively. Total employment and labor income generated by BLM resource management under Alternative C would decrease by about 8 percent compared to current management. These BLM-related contributions, i.e. jobs and labor income, would continue to be less than one percent of total within the local economy. The largest employment and labor income effects would occur in the accommodations and food services, government, and retail trade industry sectors. All program revenues to the federal government would be about $0.2 million per year. Annual payments to the State of Montana and to counties would be approximately $5.1 million, most of which would be PILT payments. The dependency of the local economy on livestock industry, timber production, mining, oil and gas exploration, and recreation activities would not be affected by BLM resource management. The influence of resource management on BLM-administered lands would not change local economic diversity (as indicated by the number of economic sectors), dependency (i.e. where one or a few industries dominate the economy), or stability (as indicated by seasonal unemployment, sporadic population changes, and fluctuating income rates).

Social Environment

Projected timber harvest levels are much lower under Alternative C than under the other alternatives. This alternative would likely be less favored than the other alternatives by those primarily concerned about timber employment. Access to firewood, Christmas trees and other forest resources would be limited under this alternative due in part to a 41 percent reduction in the roads currently available for public use to remove such materials and a 29 percent reduction in the forest and woodland area available under Alternative A through Recreational Opportunity Spectrum designation as Semi-primitive non-motorized where in some cases currently open roads would be closed.

Projected ground disturbance would be lower under this alternative than it would under the other action alternatives and, as a result, less aggressive weed treatment would be required. An estimated 16,000 to 38,000 acres of weeds would be treated per decade under this alternative.

Timber salvage would be limited under this alternative and, as a result, is less likely to be favored by those primarily concerned with salvage opportunities. Similarly, this alternative would require that firewood be live trees and could, as a result, substantially reduce the number of firewood permits.

The effects to ranchers would be similar to Alternative B. The existing Indian Creek allotment (2,215 acres and 376 AUMs), as well as any lands acquired from the Iron Mask acquisition, would be unavailable for grazing lease or permit under this alternative.

Alternative C would emphasize non-motorized recreation opportunities more than the other alternatives, with 41 percent of the Decision Area lands allocated to semi-primitive ROS classes. Based on this relative distribution, Alternative C is likely to be preferred by recreationists who favor non-motorized recreation opportunities. Management actions under this alternative are expected to result in a relative reduction in the number of visits associated with motorized vehicle travel, hunting/archery, motorized wildlife/scenery viewing, and snowmobiling. Opportunities for organized motorized events would be eliminated and the entire Scratchgravel Hills area would be closed to motorized vehicle use after dark (dusk to dawn) yearlong. This alternative would address concerns about conflicts between motorized and non-motorized use and between motorized use and livestock grazing. It would not address concerns that the Butte Field Office should provide additional motorized activities.

Annual day-use fees of $90 per commercial guided boat would be charged for commercial fishing and floating outfitters using developed BLM river access sites. Out-

fitters would be billed in advance. Commercial camping permits within developed fee sites would not be allowed during the fee season (Memorial Day to Labor Day). Special Recreation Use Permits during the hunting season would be limited to day-use activities only. Based on these constraints, commercial outfitter/guides would be less likely to favor this alternative than they would the other alternatives.

This alternative emphasizes a lesser degree of vegetative restoration than the other action alternatives (Alternatives B and D), but project-level wildlife habitat and riparian protection measures would be greater than under the other three alternatives. All four eligible Wild and Scenic River segments would be recommended as suitable for the National Wild and Scenic Rivers System and four new ACECs, including a total of approximately 76,000 acres, would be established. Based on these criteria, individuals and groups who give high priority to resource protection would likely favor this alternative.

Estimated average annual timber harvest would be lower under this alternative than under any other alternative (**Table 4-39**). Oil and gas leasing constraints would be the most restrictive of any alternative. Groups and individuals who are concerned about restrictions on resource use would likely prefer all other alternatives over Alternative C.

Effects of Alternative D

Economic Environment

Estimates of the levels of employment and labor income that would be supported by Alternative D are based on projected resource outputs and projected BLM expenditure levels (**Table 4-39**). Estimated average annual employment and labor income are summarized by resource area in **Table 4-42** and **Table 4-41**, respectively. The projected outputs and estimated employment and labor income are discussed by resource in the following sections.

Alternative D would provide for an average annual harvest of approximately 10,800 CCF of timber (**Table 4-39**).This is higher than the volumes projected for the other action alternatives. The majority of this estimate (10,700 CCF) is based on the sawtimber PSQ and reflects the annual volume that would be available rather than actual harvest projections. This harvest, if it were to occur, would support approximately 120 jobs and $3.3 million in labor income (**Table 4-42** and **Table 4-41**).

Alternative D would offer higher levels of forest product offerings with higher levels of acreage treatments; however these changes would not be large enough to cause substantial differences in local economic conditions.

Economic impacts associated with grazing management would be similar to current management (Alternative A). This alternative would authorize average annual grazing of approximately 31,200 cattle HMs and 6,400 sheep HMs (**Table 4-39**) and support approximately 10 jobs and $198,000 in labor income (**Table 4-42** and **Table 4-41**). Annual revenues from grazing permits would amount to about $35,000 (25,677 AUMs x $1.35/AUM= $34,664). Estimated total distribution to state and local counties would be about $8,400. Consumer surplus would be about $376,000. Annual federal revenues from livestock grazing and the amount distributed to the state and counties would be about the same as with Alternative A.

Alternative D emphasizes motorized access and recreation opportunities more than the other action alternatives. The total number of visits projected under Alternative D is the highest of the four alternatives. Management actions under Alternative D are projected to result in a relative increase in the number of visits associated with motorized vehicle travel, hunting and archery, wildlife and natural viewing, and snowmobiling, with the projected visits for other activities expected to remain as projected under Alternative A.

Management actions under Alternative D, coupled with an annual two percent increase in the number of visits, are expected to result in an annual average of approximately 894,000 general recreation visits and 433,000 fish and wildlife-related recreation visits (**Table 4-39**) and support approximately 800 jobs and $20.5 million in labor income (Table 4-3 and Table 4-4). Annual federal revenues from recreation management would be about the same as with Alternative A ($580,000).

Alternative D would result in the estimated average annual production of 980,000 MCF of natural gas, 330,000 tons of limestone, 400 short tons of dimension stone and 20,000 short tons of construction sand and gravel from public lands (**Table 4-39**) and support 90-100 jobs and $4.6 million in labor income (**Table 4-42** and **Table 4-41**). The economic impacts associated with minerals management would be similar to those described for Alternative A.

Estimated annual average level of activities associated with ecosystem restoration would include hazardous fuels treatments and pre-commercial thinning (3,345 acres), weed spraying (3,600 acres), road decommissioning (4 miles), and road closures (266 miles). These activities would support about 20 jobs and $750,000 in labor income.

Budget expenditures would be higher under Alternative D than under any other alternative, with the majority of the relative increase associated with expenditures in the fuels and fish and wildlife management programs. BLM expenditures under this alternative would support approximately 100 jobs and $3.9 million in labor income (**Table 4-42** and **Table 4-41**).

In conclusion, the estimated total (direct, indirect, and induced) number of local jobs and associated local labor income contributed by BLM land and resource management described above in Alternative D would be about

1,300 jobs and almost $39.3 million, respectively. Total employment and labor income generated by BLM resource management under Alternative D would increase by about 9 percent and 16 percent, respectively, compared to current management. These BLM-related contributions, i.e. jobs and labor income, would continue to be less than one percent of total within the local economy. The largest employment and labor income effects would occur in the accommodations and food services, government, and retail trade industry sectors. All program revenues to the federal government would be about $1.1 million per year. Annual payments to the State of Montana and to counties would be approximately $5.5 million, most of which would be PILT payments. The dependency of the local economy on livestock industry, timber production, mining, oil and gas exploration, and recreation activities would not be affected by BLM resource management. The influence of resource management on BLM-administered lands would not change local economic diversity (as indicated by the number of economic sectors), dependency (i.e. where one or a few industries dominate the economy), or stability (as indicated by seasonal unemployment, sporadic population changes, and fluctuating income rates).

Social Environment

Alternative D would have the highest projected timber harvest levels and would support approximately 70 jobs (**Table 4-42** and **Table 4-41**). This alternative would likely be relatively favored by the timber industry and workers concerned about employment. These potential employment opportunities represent a very small share of total employment within the Planning Area, but may be important to those concerned and may have small, but positive, impacts in one or more local communities. Access to firewood, Christmas trees and other forest resources would be reduced under this alternative due in part to a 24 percent reduction in the roads currently available for public use to remove such materials and a 16 percent reduction in the forest and woodland area available under Alternative A through Recreational Opportunity Spectrum designation as Semi-primitive non-motorized where in some cases currently open roads would be closed. Access reductions would be greater than under current conditions, but lower than Alternatives B and C.

Projected ground disturbance would be higher under this alternative than it would under the other action alternatives and, as a result, more aggressive weed treatment would be required. An estimated 25,000 to 61,000 acres of weeds would be treated per decade. Timber salvage would be limited under this alternative compared to Alternative A. Fire created salvage opportunities would be higher under this alternative than under the other action alternatives. The effects on ranching would be the same under this alternative as Alternative A. Unlike the other action alternatives (Alternatives B and C), relinquished allotments would remain available for livestock grazing leases or permits without evaluation for suburban/urban interface issues, crucial wildlife habitat, riparian values, or recreational considerations before re-offering. Fewer conflicts between ranchers and off-highway motorized vehicle users would occur than under Alternative A.

Alternative D emphasizes motorized access and recreation opportunities more than the other alternatives, with just 21 percent of Decision Area lands allocated to semi-primitive ROS classes. Based on this relative distribution, Alternative D is likely to be preferred by recreationists who favor motorized recreation opportunities, including hunters who prefer motorized hunting opportunities and groups and individuals that engage in snowmobiling. Two areas would remain open for organized motorized events and motorized and non-motorized recreational uses would be allowed 24 hours per day in the Scratchgravel Hills area in accordance with the travel management plan. This alternative would address some of the concerns about conflicts between motorized and non-motorized use. It would not address concerns that the Butte Field Office should provide additional motorized recreation activities.

BLM would postpone fees for commercial fishing and floating outfitters using developed BLM river and lake sites accessing state waterways until a multi-agency statewide fee system is established. Authorization of commercial camping activity and permit requests by outfitter and guide hunters would be considered throughout the Field Office on a case-by-case basis subject to resource constraints, management capabilities, social conflicts and public health and safety concerns. This alternative would impose fewer constraints on commercial outfitter and guides than the other two action alternatives (Alternatives B and C) and would, as a result, be more likely to be favored by those groups.

This alternative emphasizes a greater degree of vegetative restoration than the other action alternatives (Alternatives B and C), but project-level wildlife habitat and riparian protection measures would be less restrictive under this alternative than they would be under the other three alternatives. None of the four eligible Wild and Scenic River segments would be recommended as suitable for the National Wild and Scenic Rivers System. This alternative would establish two new ACECs, including a total of approximately 12,000 acres, less than half the new ACEC acres proposed under the other action alternatives (Alternatives B and C). Based on these criteria, individuals and groups who give high priority to resource protection would be less likely to favor this alternative than the other action alternatives.

Estimated average annual timber harvest would be higher under this alternative than under any of the other alternatives (**Table 4-39**). Oil and gas leasing constraints would be less restrictive than Alternatives A and B, and much less restrictive than Alternative C. Alternative D emphasizes motorized recreation opportunities more

than the other alternatives. Based on these criteria, individuals and groups who give high priority to resource use would likely favor this alternative.

Tribal Treaty Rights

Effects Common to All Alternatives

BLM will manage vegetation to fall within the historic range of variability, with diverse plant communities that contain healthy populations of a variety of native species. Enhancement of wildlife habitat and native plant communities provides increases in opportunity for tribal members to exercise tribal treaty rights such as hunting, fishing, and gathering on public lands. New road construction would not occur in association with travel plan alternatives with the exception of a small number of short routes to provide loop opportunities under Alternative D.

CUMULATIVE EFFECTS

This section is divided into two main parts. The first part describes the past, present, and reasonably foreseeable future actions on lands within the Planning Area, organized by management activities associated with the most pertinent particular resources or resource uses. Activities described under one resource or resource use heading could affect other resources or resource uses in the Planning Area. The second part of this section describes cumulative effects on resources and resource uses.

The cumulative effects analysis area for this RMP consists of the approximately 7.2 million acre Planning Area. BLM lands are generally widely scattered throughout the Planning Area and therefore tend to have a relatively small contribution to cumulative effects of all activities taking place within the Planning Area. Major approximate land ownership acreages within the Planning Area consist of the following: 3.5 million acres of private lands; 2.8 million acres of National Forest (USFS) lands; 320,000 acres of state-owned land; 307,309 acres of BLM lands (Decision Area lands); 150,000 acres of National Park Service lands; 15,000 acres of local government lands; and 11,000 acres of Bureau of Reclamation lands. BLM lands make up approximately four percent of all lands in the Planning Area. The wide distribution of BLM lands within the Planning Area make it necessary to establish such a large analysis area in order to encompass Decision Area lands addressed in this document.

Past, Present and Reasonably Foreseeable Actions

The following discussion characterizes past, present and reasonably foreseeable future actions considered in the cumulative effects analysis. More detail on these activities can be found in the administrative record.

Activities outside of BLM jurisdiction considered in the cumulative effects analysis are included. Some activities identified under a particular resource or resource use heading may affect more than one resource. For example, activities listed under Soil Resources may affect water quality. Effects are discussed in the second main part of this section. It should be noted that acreage figures are approximate based on GIS layers from multiple sources that are subject to varying degrees of error.

Soil Resources

Approximately 8,000 acres of land near Helena (Fort Harrison) in the Planning Area are managed by the National Guard. Some activities include military maneuvers, non-live fire training, and off-road use of military vehicles. Some soil compaction will likely occur with these activities.

Acquisition of the Iron Mask property would place approximately 5,565 acres of range and mountainous land under more stringent resource protection standards through the implementation of Land Health Standards than are currently in place on these private lands. In addition, the acquisition would protect the area from future development.

Expansion of the Indian Creek Mine could increase the disturbance area within the Limestone Hills Training Area from the present size of about 300 acres.

Construction and use of a 75-acre area for a new qualifying training range proposed for the Limestone Hills Training Area could result in short-term episodes of accelerated erosion during road construction and clearance for facilities. In addition, the range would be located within a grazing area and could occur on productive soils. This potential future action would result in the loss of some soil productivity and short term accelerated erosion.

The proposed Limestone Hills Training Area withdrawal of the Limestone Hills Training Area could result in a transfer of natural resource and resource use management from BLM to the Montana Army National Guard on approximately 20,000 acres of federal land. Because the Montana Army National Guard is required to manage land in accordance with requirements similar to those implemented by BLM, no different impact on soil resources is expected from this reasonably foreseeable action.

Water Resources

Canyon Ferry Reservoir and Dam on the Missouri River would continue to be operated to provide flood control, power generation, irrigation, municipal water and to stabilize downstream flows.

PPL of Montana manages water flows through Hauser, and Holter Lake dams. Hauser and Holter Lakes are managed as full-pool, run-of-river reservoirs. Flows within and through these three reservoirs are managed to

optimize energy production; provide for water right uses; and maintain appropriate conditions for fisheries, wildlife and recreation.

Since 1997, the Butte Field Office has reclaimed the Alta Mine, Comet Mine/High Ore Creek, Redwing/Waldy Mines, Gregory Mine, Bertha Mine, Park Mine/Upper Indian Creek, Wicks Smelter, Wicks Manganese, and Lower Indian Creek Dredge Piles to address water quality.

Beginning in 1997, BLM began cleanup of abandoned mines under the Abandoned Mine Lands (AML) program. To date, 14 mines have been reclaimed covering approximately 81 acres, 7 repositories were constructed, and 5 mines are planned for reclamation in the next 5 to 10 years including the Belle Lode (Wickes Manganese), Indian Creek Dredge Piles, Great Divide, Iron Mask and Hard Cash.

Irrigation of privately owned lands will continue.

Vegetation

The Vegetation Management EIS (Draft EIS, November 2005) covering 17 western states, including Montana, expanded herbicide use and allows for use of new herbicides to improve BLM's ability to control hazardous fuels and unwanted vegetation.

Vegetation disturbances likely occur from National Guard training activities. The Guard inventories, maps, and treats noxious weeds on their lands. In the past wildland fires have occasionally initiated there as a result of training exercises.

There are approximately 3.5 million acres of private lands within the Planning Area. Vegetation management will likely include loss of vegetation from road construction and residential development, effects of continued livestock grazing, forest fuels reduction in urban interface areas and timber harvest for commercial uses.

Vegetation management will continue on National Forest System lands (outside some special designation areas) including noxious weed treatment and control, livestock grazing, road construction/management, forest products removal, timber salvage, fuel reduction and wildland fire suppression. Effects would likely be most pronounced on 2.1 million acres, but less pronounced on the approximately 700,000 acres of wilderness on National Forest lands in the Planning Area.

Wildlife

Past, present, and reasonably foreseeable actions focused on wildlife and wildlife habitat on BLM lands include: establishment of a multi-party vision for vegetation conditions in the Elkhorn Mountains Cooperative Management Area to benefit wildlife, primarily big game; reintroduction of bighorn sheep into historically occupied habitat in several locations including Crow Creek and Indian Creek areas in the Elkhorn Mountains, the Sleeping Giant area, and the Camp Creek/Soap Gulch area in the Highland Mountains; restoration of approximately 1,000 acres of bighorn sheep habitat through vegetative treatments in the Shep's Ridge area (6 miles west of Townsend); and vegetative treatments to improve approximately 700 acres of habitat in the Toll Mountain area to provide a desirable mosaic of vegetative conditions for local wildlife species.

The Canyon Ferry reservoir supports white-tailed and mule deer, antelope, elk, moose, grouse, ducks, geese, pheasants, numerous song birds, beavers, mink, bald eagles, osprey and other raptors. Approximately 11,500 acres of Bureau of Reclamation lands surrounding Canyon Ferry will continue to be managed to enhance wildlife.

Approximately 170,000 acres in the Planning Area are managed by MFWP as wildlife management areas.

Approximately 2.1 million acres of National Forest lands are managed for multiple use including maintenance and improvement of wildlife habitat through projects such as noxious weed reduction, removal of conifer encroachment in grasslands and shrublands, conifer thinning, road closures, and aspen and riparian restoration. An additional approximately 700,000 acres of National Forest lands are in wilderness where wildlife remains relatively undisturbed by human activity.

An additional approximately 150,000 acres in the Planning Area are within the boundary of Yellowstone National Park and are managed for natural values including wildlife.

Fish

Fish populations are subject to recreational fishing throughout the Planning Area. Rivers that provide high quality opportunities include the Big Hole River, Missouri, Jefferson, and Madison. Within the Decision Area, Hauser and Holter Lakes as well as Canyon Ferry provide sport fisheries. Most sport fisheries are for non-native fish species such as rainbow trout, brown trout, brook trout, walleye, and yellow perch.

Approximately 11,500 acres of Bureau of Reclamation lands surrounding Canyon Ferry will continue to be managed to enhance fish. The Canyon Ferry reservoir supports a wide variety of sport fish, including rainbow and brown trout, perch, and walleye.

There is one fish hatchery in the Planning Area, located in Anaconda and operated by Montana Department of Fish, Wildlife, and Parks. This hatchery focuses on propagating westslope cutthroat trout for stocking into local lakes, ponds, and waterways to provide sportfishing opportunities. This hatchery may also provide westslope cutthroat trout for restorative re-introduction projects.

Special Status Species

Federal and state land management agencies will continue to protect habitat for listed species as required by law. Protection for sensitive species will continue on most federal and state lands. No specific requirements for the protection of sensitive species exist on privately owned lands. Some species listed as Threatened on the Endangered Species List could be removed from the list, and others may be added.

One of the most impactive human activities affecting special status fish populations has been the historic stocking of non-native fish. Throughout the Planning Area non-native fish have either outcompeted or hybridized with native fish such as westslope cutthroat trout, Yellowstone cutthroat trout, bull trout, and to some extent Arctic grayling. The result has been broad-scale displacement of native fish species from their historically occupied habitat.

Recent projects on BLM lands to improve habitat for special status fish species include the following: pool creation in LaMarche Creek, tributary to the Big Hole River, to benefit Arctic grayling; and watershed restoration including road decommissioning and instream wood placements in Nursery Creek, tributary to Muskrat Creek in the Elkhorn Mountains, to benefit westslope cutthroat trout.

BLM has continued to be a funding partner in re-establishing the genetically pure westslope cutthroat trout population in Muskrat Creek from approximately 1997 to the present. This project has entailed removal of non-native brook trout and establishment of a barrier to prevent brook trout immigration at the downstream end of approximately 5.3 miles of habitat now occupied solely by westslope cutthroat trout.

Wildland Fire Management

Treatments

Fuel reduction and fire management actions that have occurred recently include prescribed fire (472 acres) and mechanical treatments (141 acres) in the Big Hole Watershed since 1997.

Planned projects in the Big Hole watershed include prescribed fire on 3,159 to 4,159 acres with prescribed fire and approximately 3,087 to 7,087 acres of mechanical treatment.

BLM has treated approximately 2,332 acres of forest and non-forest ground with prescribed fire, and approximately 2,339 acres of the same using mechanical methods since 1997 in the Jefferson River watershed.

In the Missouri River watershed, BLM has treated approximately 4,965 acres with prescribed fire and 2,284 acres with mechanical methods since 1997. Currently three projects are planned with prescribed fire on a total of approximately 314 acres, and mechanical treatment is planned on approximately 8,500 acres could occur in these areas over approximately the next decade.

In the Yellowstone River watershed, BLM has treated approximately 40 acres with prescribed fire and currently, no mechanical or prescribed fire treatments are planned.

Wildland fire suppression and management will continue on most lands within the Planning Area, including state, private, Bureau of Recreation, BLM, and National Forest Lands. Counties within the Planning Area have generally developed plans to identify where fuels treatments are needed to protect communities. Federally managed lands generally have a plan in place that allows some areas to burn where conditions would result in beneficial vegetation changes as a result of naturally occurring wildland fires.

Vegetation management on privately owned lands and National Forest System lands will likely include forest fuels reduction in urban interface areas.

Wildland Fire

The Butte Field Office has record of approximately 200 wildland fire starts in the Planning Area from 1981 to 2004, 93 of which were lightning caused, and 107 of which were human-caused wildfires. The total acres were approximately 20,257.8 acres from human-caused wildland fire and 435.8 acres of lightning caused wildland fire. Wildland fire will continue to occur in the Planning Area. The numbers of recorded fire starts and acres affected may increase in rate in the future because past fire statistics underestimated past fire history and hazardous fuels buildup has made fires harder to control.

In the past wildland fires have occasionally initiated from National Guard training exercises.

Across the Planning Area, wildland fires will continue to be ignited from lightning and human activities (mostly accidental). In most cases, these fires will continue to be suppressed to protect health, safety, property, and natural resources. Some may be allowed to burn where a plan is in place and results would be beneficial.

Forestry and Woodland Products

Table 4-43 characterizes the forest products removed from BLM lands prior to and after 1996. For the same period of time, this amounts to less than 20 percent of the total product volume removed from BLM lands in Montana and less than 0.1 percent from all timber lands in Montana for the same period (USFS Region 1, 2005). Out of a total timber harvest of 6,994 MMBF in Montana during that period, private lands harvested approximately 70 percent, state lands under DNRC administration harvested 5 percent and the National Forests harvested 19 percent.

Removal of forest products will continue mainly from privately owned lands in the Planning Area as well as

from State Lands managed by DNRC and the non-wilderness National Forest System lands, including timber salvage.

Livestock Grazing

In the past, livestock grazing has been permitted on approximately 90 percent of Butte Field Office lands, or 273,000 acres. On average, 70 to 75 percent of allowable AUMS (25,677 Active preference) have been activated each year—roughly 18,000 to 19,000 AUMS.

Livestock grazing and vegetation management to facilitate availability of livestock forage will continue on privately owned lands. The extent of livestock grazing on private lands wills likely decrease over the next 20 years due to continuing subdivision and residential development of existing ranches.

Other past and future grazing related activities include development of livestock water wells, new spring developments, new fence construction, and fence removal.

Livestock grazing will continue on National Forest lands throughout the Planning Area. This will likely focus mostly on the 2.1 million acres available for multiple use. Some livestock grazing may occur in the 700,000 acres of wilderness areas on National Forest System lands but relatively little commodity production would occur here.

Energy and Minerals

Leasable Minerals

There are currently 34 suspended lease nominations within the Planning Area covering approximately 41,611 acres. These parcels will be offered for lease when this RMP is finalized. In addition there are seven lease nominations covering approximately 4,892 acres under review by BLM staff as of July 2006. In June 2006, nine leases were issued by the BLM for lands within Broadwater and Gallatin counties for mineral estate under BLM jurisdiction. These leases cover approximately 7,583 acres. Activity is anticipated to take place from 2006 through 2016. If fluid minerals are discovered then activity would expand and occur over a much longer time period.

It is estimated that a total of 31 conventional oil and gas wells could be drilled, most likely within the five areas with the most potential over 15-20 years. Nineteen of these wells would be exploratory, with six of them being producers. The RFD assumes that there would be two additional step-out wells developed for each of the six producers, resulting in a total of 18 producing wells overall. The RFD also assumes that seven of these producing wells would be on federal mineral estate with the remainder being non-federal. As many as 40 wells might be drilled for coal bed natural gas, most likely near Bozeman Pass. None of this activity is forecast to take place on federal mineral estate. (A further description of the RFD scenario can be found in **Appendix M – Fluid Minerals**). Each well would consist of a well pad, mud pit, and staging complex, generally totaling less than 5 acres per site with associated access roads if needed.

In addition to BLM activity, there are currently 68 suspended oil and gas leases on the Gallatin National Forest that cannot be developed until the Forest Service, with assistance from the BLM, completes an EIS that examines the effects of leasing and development of these leases.

Canyon Ferry Reservoir and Dam on the Missouri River would continue to be operated to provide power generation. Water flow through Hauser and Holter Lake dams will continue to be managed to optimize energy production.

Locatable Minerals

Larger-scale mining operations are listed in **Table 4-44**.

The Butte Field Office routinely permits a number of small scale placer mining operations. These take place in various locations throughout the field office and collectively occupy up to 30 acres of BLM land at any one time. Small-scale placer mining has taken place since before the previous RMP was written and will continue into the foreseeable future.

At any given time there are a number of precious and/or base metal exploration projects taking place at various locations throughout the field office. These may occupy up to 30 acres of BLM land at any one time.

Salable Minerals

Table 4-43
Forest Products Removal History

Forest Product	1984 – 1995	1996 – 2004
Sawtimber (MMBF)	2.951	6.444
Christmas Trees and Boughs (# of trees/lbs. of boughs)	6,633/500	4,013/1,500
Post and Pole Sales (CCF)	253	50
Public Use Products (# permits)	No data	352
Firewood (cords)	1,082	694
Trespass (MMBF)	0.4	0.4

Table 4-44
Present and Foreseeable Mining Activity

Name	Description	Location	Approximate Size	Anticipated Operation Timeframe
	rock quarry railroad ballast and other durable crushed rock	T2N, R5W, Section 20	55-acre	1992 - 2010
Golden Sunlight Mine	gold and silver open pit mine	T2N, R3-4W,	2,500 acres with approximately 600 acres on BLM	1992 - 2010
Montana Tunnels Mine	lead and zinc with associated gold and silver from an open pit mine	T7N, R4W, various sections	1,500 acres with 130 acres on BLM.	1986 - 2008
Graymont Western U.S.	limestone to produce lime and hydrated lime	T7N, R1E, various sections	600 acres on BLM	1981 - 2060
Bald Butte Mine	molybdenum	T11N, R6W, section 10	Currently less than 5 acres, likely to expand to a total of 30 acres with 5 acres of BLM	2006 - 2015

The Butte Field Office routinely permits a number of mineral material sales, the majority of which are sand and gravel for county or state use. These take place in various locations throughout the field office and collectively occupy up to 30 acres of BLM land at any one time. These sales have been important sources for construction material in the past and will continue into the foreseeable future.

Mineral Developments on Private Land

On private land, Holcim currently mines limestone north of the town of Three Forks (T2N, R3E, various sections). This mine is approximately 300 acres, none of which occurs on BLM lands.

Ash Grove Cement company mines limestone west of Montana City (T9N, R3W, various sections) on approximately 100 acres. None of this occurs on BLM lands.

Activity began in 1980 and is anticipated to continue until approximately 2060.

The Butte Mine operated by Washington Group is currently mining molybdenum, copper and associated precious metal by-products from the open pit mine in Butte. This activity occurs in uptown Butte over an extensive area of several thousand acres. Mining activity has occurred here since 1870 and will likely continue well into the foreseeable future. None of this ongoing activity is on public land.

Recreation

Past, present, and reasonably foreseeable actions include ROS designations; improvement of recreation sites at White Sandy, Holter Dam, Holter Lake day-use facilities, French Bar, and Spokane Bay; 15 to 20 special use permits annually for a variety of events; VRM classification; and continued management of 49 recreation sites on BLM lands.

Canyon Ferry will continue to be managed to enhance recreation. There are approximately 24 recreation sites around the reservoir, 12 of which are managed for camping. In addition there are three boat marinas that are managed as private concessions.

Lands owned by local governments in the Planning Area would continue to be managed as parks to provide public recreation opportunities.

On National Forest Lands, Recreation Opportunity Spectrum classifications would continue to be used to manage for a variety of recreation opportunities, including road access and degree of development.

The BLM will continue to participate fully in the coordinated management of the Missouri River through the Missouri River Comprehensive Recreation Plan.

Motorized and non-motorized recreation and developed and undeveloped recreation will continue on state and federal lands.

Travel Management and Access

Past, present and reasonably foreseeable future actions for Travel management and access are discussed in the "Environmental Consequences of Five Site-Specific Travel Plans" section.

Lands and Realty

Land Use Authorizations

The Butte Field Office administers approximately 554 rights-of-way, which encumber over 40,837 acres of BLM land including: water pipelines, communication sites, ditches, railroads, material sites, fiber optic lines and a Montana Army National Guard training site. Road rights-of-way are the most common type of grant, accounting for 53 percent, or over half of the total. Approximately 10 to 15 right-of-way actions are processed annually.

Twenty communication site rights-of-way on seven different locations are authorized within the Planning Area.

The Butte Field Office administers seven FLPMA Section 302 leases involving about 910 acres of BLM land (BLM 2004i): 904.91 acres to the Great Divide Ski Area and six occupancy leases for a total of 5.3 acres. There are no permits or easements under Section 302 of FLPMA or airport leases located within the DA. One R&PP lease has been issued under Section 212 of FLPMA to the Last Chance Handgunners involving 39.1 acres (USDI-BLM 2004i). R&PP patent transfers are discussed below under the section Land Ownership Adjustment.

Approximately 20,000 acres in the Limestone Hills west of Townsend, is under a right-of-way grant held by the Montana Army National Guard for military training purposes (BLM 1984c).

Wind Hunter LLC has submitted an application for a Wind Energy Site Testing and Monitoring Facility near Whitehall Montana.

Land Ownership Adjustments

Seven land acquisitions were completed using Land and Water Conservation Fund (LWCF) appropriations: one in the Devil's Elbow area, two associated with Crimson Bluffs, portions of the Iron Mask Ranch, McMaster Ranch, and a small portion of the Ward Ranch. The Causeway Land Exchange is currently pending. Eight parcels of land were donated to the United States, through BLM: one in the Sleeping Giant area, two on Holter Lake, two on the Ward Ranch, two at Iron Mask, and one at White Sandy. Three land sales were completed, one southeast of Mount Helena, one near Montana City, and one east of Holter Lake.

The Butte Field Office completed five Recreation and Public Purposes (R&PP) patent transfers since approval of the Headwaters RMP. These are: 34.09 acres to the MFWP for a recreation site; 40 acres to Lewis and Clark County for a sewage treatment area; 71.62 acres to Jefferson County for a warehouse and storage area; 400 acres to Broadwater County for a shooting range; and 622.38 acres to MFWP for expansion of the Beartooth State Wildlife Management Area.

Table 4-45 lists land ownership adjustment actions for the Planning Area since the approval of the Headwaters RMP in 1984. Note that acreage values are approximate.

Access

Since 1984, 40 permanent exclusive easements were acquired for legal access to BLM land. Six permanent non-exclusive easements were acquired. Eleven temporary easements, encroachment permits/easements or permanent easements for specific projects such as fences, livestock or water pipelines and troughs were acquired.

Special Designations

Nearly 700,000 acres of National Forest are designated wilderness lands managed to protect natural values and provide non-motorized recreation experiences.

The Forest Service is the lead managing agency for the Continental Divide National Scenic Trail and is currently in the process of reconstructing and upgrading numerous segments of this trail system. The National Park Service is the lead managing agency for the Lewis and Clark National Historic Trail.

Social and Economic

No cumulative impacts were identified for Environmental Justice.

Social Conditions

Under all the RMP alternatives, public access and recreational opportunities have the greatest potential to affect social conditions. As such, Alternative C, being the most restrictive on public access for firewood and other product gathering as well as motorized recreational access, would have the greatest cumulative effects. Other federal land management agencies in the Planning Area are following a trend of reducing motorized access. Alternatives B and D also reduce motorized access and would have some cumulative effects as described above, but not to the same degree. Alternative A maintains current access. Since BLM manages only 4.2 percent of the access in the Planning Area, the extent of cumulative

Table 4-45
Land Ownership Adjustment Actions Since July 1984

Type of Action	Number of Actions	Acres Disposed	Acres Acquired
Public Sales	3	10	-
Purchases	4	None	140
LWCF Purchases	9	None	8,987
Donations	7	None	2,352
R&PP Patent transfers	5	1,168	-
Land Exchanges	13	23,290	18,895
Total Acres		**24,468**	**30,374**

effects is not great. However, federal and state public lands are used more extensively than other lands for these purposes.

Economic

Outputs compared to the overall output in the Planning Area are relatively minor and cumulative impacts from BLM resource management would likely not be noticeable.

The differences in timber production between the alternatives would amount to less than five percent of the annual timber volume removed from the Planning Area.

Reduced AUMs in Alternatives B and C would place additional grazing pressure on private lands and/or increase the demand for hay or other forage alternatives. Expanding recreational demand across all alternatives could increase opportunities for private sector business growth.

While some BLM actions may affect individuals or businesses in a few communities, none of the alternatives would cause more than one percent change in local employment or labor income over the Planning Area.

Public Health and Safety

Under all alternatives, BLM actions to reclaim abandoned mine lands should contribute to a cumulative beneficial effect to public safety by reducing the numbers of hazardous mine openings and improving water quality in areas where projects occur.

Tribal Rights

Cumulative impacts on cultural resources may occur through incremental resource degradation. Decreases in resource conditions such as water quality, riparian habitat, wildlife forage, native plant communities, or land tenure and access could affect cultural, traditional, and other tribal treaty rights important to Native Americans. If resources were to become scarce on BLM lands or other adjacent federal lands, there could be increased competition between tribal members and non- members for these resources.

CUMULATIVE EFFECTS ON RESOURCES

Cumulative effects discussions below are general due to the general lack of site-specificity of proposed management actions in RMP alternatives. At the activity plan or project level, site-specific NEPA analyses would be completed for proposed management actions. Finer scale cumulative effects analysis would occur within these finer scale NEPA documents and would more specifically analyze and describe cumulative effects to pertinent resources and resource uses.

Cumulative effects on resources or resource uses may result from any of the alternatives considered. For many resources (air, soil, special status species, cultural and paleontological resources, energy and minerals, transportation facilities, lands and realty, special designations), and tribal rights) management actions in each alternative are similar enough that the cumulative effects would be the same. Cumulative effects for those resources are discussed below, but not by alternative. For other resources (water, vegetation, wildlife, fish, wildland fire management, visual quality, forestry and woodland products, recreation, transportation, and access, and social and economic conditions) management actions would result in differing direct and indirect effects and therefore, their potential cumulative effects may vary. Cumulative effects on those resources are broken out by alternative.

Table 4-46
Percent of Each Watershed Managed by BLM

Watershed	Total Acres in Watershed	BLM Managed Acres In Watershed	Percent of Watershed Managed by BLM
Blackfoot	126,749	932	0.7%
Big Hole	406,542	58,983	14.5%
Boulder	485,996	40,341	8.3%
Gallatin	1,023,095	872	0.1%
Jefferson	465,188	40,748	8.8%
Shields	514,509	223	0.0%
Upper Missouri	1,894,597	153,103	8.1%
Upper Clark Fork	520,950	649	0.1%
Upper Yellowstone	994,054	8,010	0.8%
Scattered*	760,669	3,449	0.5%
Total	7,192,349	307,309	4.2%

*These acres occur within the counties that make up the Planning Area, but not in any of the major watersheds listed.

An important component of the cumulative effects analysis is the degree of influence that management actions taken by the BLM would have when added to actions taken by other land owners or management agencies. Because of the distribution of public lands managed by BLM in any particular watershed, BLM's actions would have limited impacts on the ecosystem and human environment. **Table 4-46** demonstrates the percent of each watershed managed by BLM. As shown, over the extent of the Planning Area, BLM manages slightly more than four percent of the land base.

Air Quality

Smoke from prescribed or wildland fires burning on state, federal, and private land could cause air quality to deteriorate in local airsheds. Large wildland fires or escaped prescribed fires could occur simultaneously, resulting in an increase in air quality degradation caused by separate events. Dust generation from unpaved federal, state, and county roads would add to the particulates contributed by smoke.

Additional adverse effects to air quality due to airborne dust and greenhouse gas (GHG) emissions would occur from a variety of activities in the Planning Area such as vehicle emissions, residential and industrial developments on non-BLM lands, agricultural uses, energy development, and energy consumption in day to day human life activities. Contributions of BLM activities to greenhouse gas emissions would be relatively low in the context of other activities on non-BLM lands due to the dominance of non-BLM lands and the presence of many human communities within the Planning Area. On BLM-administered lands, greenhouse gas emissions would originate from implementation of BLM projects, permitted public recreation and use of roads/trails, permitted livestock grazing, and potential oil and gas exploration and development.

While oil and gas development potential is low overall on BLM mineral estate lands, the RFD predicts up to 7 producing federal conventional gas wells. This represents a small proportion of the total of up to 18 producing conventional oil and gas wells, and up to 30 producing coalbed natural gas wells forecast in the RFD Planning Area-wide. The wells on federal mineral estate would constitute approximately 0.1 percent of projected state-wide oil and gas development. Greenhouse gas emissions from this activity would be minor at both the Planning Area-wide and state-wide scales. While there are potential emissions of GHGs from the RFD for oil and gas development in this RMP, these effects may not actually occur. The Butte Field Office would permit the development in the RFD, but this office has not received an Application for a Permit to Drill (APD) on any of its federal mineral estate lands in over 20 years.

While some BLM activities would emit GHGs, carbon sequestration would also occur on BLM lands as vegetation takes in and uses carbon dioxide. Vegetation treatment activities may promote increased carbon sequestration in the long-term. It is unknown whether BLM lands and activities would be a net source or sink of GHGs under the various RMP alternatives.

Soil Resources

All identified reasonably foreseeable activities across all land ownerships in the Planning Area would contribute to soil disturbance, erosion, and compaction. At the scale of the 7.2 million acre Planning Area, the extent of effects from BLM activities would be relatively minor.

Within the RMP alternatives, livestock grazing, vegetation treatments, roads management, and mining activities have the greatest potential to contribute to cumulative effects to soils on BLM lands. Alternatives A and D would likely contribute the greatest to cumulative effects to soils. Alternative B would contribute less than either Alternative A or D, but more than Alternative C.

Water Resources

Under all alternatives, water quality on BLM managed lands should improve, over the long-term, through the management actions proposed in these alternatives. The most important actions are improving riparian conditions through the use of the Riparian Land Health Standard and vegetative restoration, road closures and reclamation, abandoned mine land reclamation, and reducing the risk of high severity fire.

While ground disturbing activities on adjacent ownerships would continue to affect BLM managed lands, there should not be substantial increases in adverse effects over the current levels. Part of the reason for this is that there are now several watershed groups in the area that have been formed to improve water quality at the watershed scale. This is a ground based effort that includes local landowners, conservation districts, environmental groups, local governments, state government, and other federal governments. The efforts of these groups should improve overall water quality throughout the Planning Area.

Another factor that should lead to improved water quality is the anticipated completion of several "Total Maximum Daily Loads" (TMDL). The Lake Helena TMDL has already been completed and water quality restoration work is already being planned (road rehabilitation). TMDLs for the rest of the Planning Area are scheduled for completion by 2012. The BLM would also work with Montana Department of Environmental Quality to ensure that contaminants affecting BLM resources are addressed, regardless of ownership (as noted in our 2002 Memorandum of Understanding).

Given the expected long-term improvements on both BLM and non-BLM managed lands, there should be an overall cumulative improvement of water quality under all alternatives. Potential impacts resulting from additional decreases in stream flow should be negligible

since most basins in the Planning Area are closed to additional appropriation.

Of the alternatives, B and C would tend to minimize cumulative effects to water quality associated with erosion and sedimentation because they provide for Riparian Management Zones that would be more protective of water resources than the standard Streamside Management Zones provided for under Alternatives B and D. These alternatives also have the greatest potential for water quality improvement due to road related restoration and reduced grazing impacts.

It is expected that coalbed natural gas would be developed in the Butte Field Office on non-federal lands. These wells would likely be injected with a combination of sand and chemicals to allow the gas to flow to the surface. The fluids can migrate along the coal seam and contaminate groundwater and streams (Pembina 2007). After completion, water produced during coalbed methane operations may have high levels of salinity that may seep into the groundwater or be directly discharged into stream channels (Davis et al. 2006). The production of water from coalbed methane developments can significantly drawdown aquifers and reduce important ground and surface water. This could reduce the flow in rivers and streams adjacent to the wells. In this case, based on projected well depths, it is assumed that produced water would be reinjected if technically possible and not disposed of on the surface which will mitigate potential impacts.

VEGETATIVE COMMUNITIES

Table 4-47 displays the extent of proposed vegetation treatments on communities on BLM lands within the Planning Area per decade.

Grasslands and Shrublands

Management actions on grasslands and shrublands throughout the Planning Area (e.g., prescribed fire, weed treatments, livestock grazing, mechanical treatments, and reseeding) would affect vegetation composition and structure. Grasslands and shrublands would likely continue to be altered or lost on private lands where residential and urban development occurs. Although proposed vegetation treatments on Decision Area lands would vary by RMP alternative (**Table 4-47**), effects at the Planning Area scale would be minor for all alternatives.

Riparian

Riparian vegetative communities would likely continue to be altered on private lands by residential/urban development, mining, livestock grazing, road construction, timber harvest, wildland fire, and other uses.

On public lands riparian vegetation would continue to be affected primarily by livestock grazing, wildland and prescribed fire, timber harvest, road construction/maintenance, and in some cases mining exploration and development.

Although proposed vegetation treatments to restore riparian vegetation communities on Decision Area lands would vary by RMP alternative (**Table 4-47**), effects at

Table 4-47
Acres of BLM Land and Percent of Planning Area Totals by Vegetation Zones Treated Per Decade in the Planning Area by Alternative

			Acres and % of Planning Area Treated Per Decade on BLM Lands*			
Vegetation Zone	**Acres in Planning Area**	**% of Acres in Planning Area**	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**
Grassland Zone	2,451,212	34	5,250	11,800	2,000	19,050
			0.2%	0.5%	0.1%	0.8%
Shrubland Zone	313,385	4	0	3,650	750	6,800
			0.0%	1.2%	0.2%	2.2%
Dry Forest	1,091,820	15	5,100	14,750	4,800	18,200
			0.5%	1.4%	0.4%	1.7%
Cool Moist Forest	800,387	11	2,400	3,750	550	5,050
			0.3%	0.5%	0.1%	0.6%
Subalpine Fir Zone	1,305,766	18	0	0	0	0
			0.0%	0.0%	0.0%	0.0%
Riparian	171,313	2	30	700	200	1,700
			0.0%	0.4%	0.1%	1.0%
BLM Treatment Totals/			12,780	34,650	8,300	50,800
Percent of PA Total Acres			0.2%	0.5%	0.1%	0.7%

*Based on top range identified in Chapter 2.

the Planning Area scale would be minor for all alternatives.

On Decision Area lands, Alternatives B and C would lessen impacts to riparian vegetation associated with potentially harmful activities and promote vegetative recovery more than Alternatives A and D due to the provision of Riparian Management Zones in Alternatives B and C. This effect would be minor in the context of the Planning Area scale.

Forests and Woodlands

Timber harvest activities would continue on private, state, and federal land throughout the Planning Area. On private lands in urban interface areas there would likely be a focus on removing trees and snags to reduce fuel loading, especially where forest insects or disease have caused substantial tree mortality. Some forest and woodlands on private lands may be converted to residential or urban developments.

Roads built to access forest treatment units on BLM land may lead to timber harvest on adjacent land. Under all RMP alternatives, timber harvest and other vegetation management actions on BLM lands would be geared toward restoring forest health in most cases. This could reduce vegetation density and fuel loads and help prevent wildland fires that could affect non-BLM vegetation resources in the Planning Area.

Although proposed forest vegetation treatments on Decision Area lands would vary by RMP alternative (**Table 4-47**), effects at the Planning Area scale would be minor for all alternatives.

Noxious Weeds

The total acres of noxious weed and non-native invasive species infestations would increase in the Decision Area. Noxious weed infestations would increase on BLM land and on adjacent private, state land and other federal land through natural expansion and with management actions that disturb soils and vegetation and increase motorized traffic. Noxious weeds would also increase with severe wildland fire on BLM and adjacent land. Infestations of noxious weeds and non-native invasive species could displace desirable native plants and increase erosion.

WILDLIFE

Vegetation management and travel management in the RMP alternatives have the most potential to affect wildlife. Many other activities would continue to occur within the Planning Area that can also affect wildlife including timber harvesting, livestock grazing, fire, road construction and use, mining, weed treatment, residential and commercial development, and recreational activities. Low density rural home development is the fastest growing form of land use in the United States since 1950 (Hansen et al. 2005). Many people are choosing to live away from town on small parcels of land or in rural subdivisions. This is currently occurring adjacent to many communities in the Planning Area including but not limited to; Helena, Butte, Bozeman, Livingston, and Boulder. Land that was traditional used for ranching, forest products, or mining is now being converted to home sites. Although these lands had historic human uses, they also provided quality and/or functioning wildlife habitat. Historically, these areas provided a diversity of habitats that contributed to; big game winter range, travel corridors, habitat for resident and migrating wildlife, as well as foraging, breeding and hiding habitat. For many plant and animal communities, native species richness decreases as housing density increases. Non-native species, however, tend to increase with development (Hansen et al. 2005). Wildlife populations, including carnivores, may be reduced even at very low levels of residential development due to; loss of habitat, an increase in human access (from roads) in areas that previously had low levels of disturbance, and an increase in hunting pressure. Residential development can also lead to an increase in noxious weed infestations that can reduce the quality and quantity of wildlife habitat.

Pets can also have a negative impact to native wildlife. Cats hunt and kill birds and small mammals. Dogs that are allowed to roam can chase, injure, or kill wildlife. This can result in areas becoming unavailable to wildlife.

Other federal and state agencies are generally following a trend of reducing areas where motorized access is allowed in the Planning Area. As shown in Appendix P of the AMS (USDI-BLM 2006c), timber harvest has also declined across the Planning Area in the last 30 years, which reduces human disturbance of wildlife, including roads and road use.

Throughout the Planning Area, regardless of land ownership, roads can impact wildlife in a number of ways. Roads can increase harassment, poaching, collisions with vehicles, and displacement of terrestrial vertebrates, affecting a variety of large mammals such as caribou, bighorn sheep, mountain goat, pronghorn antelope, grizzly bear, and gray wolf. Direct mortality of large mammals on forest roads is usually low, except for those with a home range that straddles a road. Forest roads pose a greater hazard to slow-moving migratory amphibians than to mammals. Nearly all species of reptiles seek roads for cooling and heating. Vehicles may kill considerable numbers to a point of making well-used roads population sinks for some species. Roads can prevent wildlife movement, create disturbance, cause the spread of noxious weeds, and fragment habitats on the landscape. Open roads typically increase the level of recreation within areas adjacent to them. This can result in additional disturbance or displacement of wildlife species within the vicinities of more heavily used open roads.

Timber harvest has declined across the Planning Area over the last 30 years. This reduction in timber harvest activity has resulted in reduced alteration of habitat and

disturbance to wildlife associated with timber harvest operations including road construction and use.

Alternative C reduces the effects on wildlife associated with roads and in some cases disturbance due to other management actions more than the other RMP alternatives and therefore would contribute less to the cumulative effects. Alternative A would contribute the most, followed by Alternative D, then Alternative B. With any RMP alternative, the relative extent of effects at the Planning Area scale is limited by the area of BLM lands where effects could occur, less than five percent of the Planning Area.

Alternative D would, however, be the most active in restoring vegetation to more resemble its historic conditions, which would, in turn benefit most wildlife within the cumulative effects analysis area (Planning Area) in the long-term. Alternative B would have the second greatest long-term benefits to wildlife of all alternatives due to vegetation restoration, followed by Alternatives A and C. Again, the extent of the effects is limited by the acres BLM manages.

Livestock grazing in the Planning Area could reduce the amount of annual residual grass, forbs, and shrub vegetation, and potentially cause changes to productivity. In the Decision Area, the applied utilization and resource management standards would provide for maintenance or improvement of vegetative and soil resource conditions that are consistent with objectives. Deferred and rotational grazing systems used in allotments would vary the time of year each pasture is grazed so plants have the ability to reproduce and recover.

Throughout the Planning Area, continued development of mining operations can affect wildlife by reducing the quality and quantity of habitat available, creating disturbance to wildlife, and releasing contaminants. Effects to wildlife from mining vary by the size and nature of individual operations.

FISH

BLM is responsible for managing lands containing about 239 miles of the 7,638 miles of stream within the Planning Area (3 percent). Consequently, the variation between effects from most activities within the RMP alternatives is likely to be immeasurable within the cumulative effects analysis area. Additionally, activities that occur on other ownerships have a much greater potential to have effects on fisheries at the Planning Area scale than the BLM's RMP alternatives.

The types of activities that can result in cumulative effects to fisheries include, but are not limited to, new proposals and ongoing actions involving:

- Salvage timber harvest;
- Green tree timber harvest;
- Log hauling on unpaved county and private roads;
- Livestock grazing;
- Placer and hard-rock mining;
- Highway construction;
- Construction or maintenance of power transmission corridors;
- Maintenance of irrigation diversions;
- Maintenance of existing communication lines;
- Crop production;
- Herbicide application for weed control;
- Road and highway maintenance;
- General travel management;
- Construction of new or improvement of existing developed recreational sites; or,
- Fisheries and watershed enhancement projects.

Many watersheds in the Decision Area are already in less than optimal condition due at least partly to negative cumulative effects that have occurred from past activities. In some cases, ongoing activities or conditions present from past activities continue to result in localized negative effects on fisheries and aquatic resources.

The effects of roads on aquatic habitat can be widespread. At the landscape scale, roads can influence the frequency, timing, and magnitude of disturbance to aquatic habitat. Increased fine-sediment composition in stream gravel has been linked to decreased fry emergence, decreased juvenile fish densities, loss of winter carrying capacity, and increased predation of fishes, and can reduce benthic organism populations and algal production. Roads can act as barriers to migration, lead to water temperature changes, and alter stream flow regimes. Improper culvert placement at road-stream crossings can limit or eliminate fish passage. Roads greatly increase the frequency of landslides, debris flow, and other mass movement. These effects are currently taking place to varying degrees across all land ownerships in the Planning Area. In some areas where increased residential or urban development occur on private lands, these effects would likely increase in severity.

Within Decision Area lands, Alternative C would have the least contribution to adverse cumulative effects to fisheries resources associated with roads and vegetation treatments combined. Alternative D would have the greatest contribution of all alternatives associated with roads and vegetation treatments combined. Alternative A would have the greatest contribution to cumulative effects associated with roads but a lesser contribution associated with vegetation treatments than Alternative D. Alternative B would have a greater contribution to cumulative effects to fisheries resources associated with roads and vegetation treatments than Alternative C but a lesser contribution than either Alternatives A or D. Although Alternative B proposes more ground-disturbing

vegetation treatments than Alternative A, it also establishes more protective Riparian Management Zones than the Streamside Management Zones provided in Alternatives A and D.

Mineral development has occurred across the region in the past and will continue into the future. The effects from mining in both the Planning and Decision Areas could be loss of habitat due to placer mining and mining in riparian habitat, the introduction of contaminants and effects due to associated development such as roads and facilities. Mining in the Planning Area could result in isolated populations of aquatic species or the decline in species.

Other effects of activities in the Planning Area could include loss of fish habitat or reduction in habitat quality associated with oil and gas related development, prescribed fire or wildland fire, or water diversion and reservoir drawdown.

Special Status Species

Activities on non-federal lands such as timber harvest, livestock grazing, residential development, mining, agriculture, and road construction would negatively influence special status species. Human developments are expected to expand in major valleys, resulting in barriers to movement and displacement or increased mortality of grizzly bear, wolf, and lynx.

Loss of riparian habitat associated with residential and industrial development and agriculture on non-federal land is expected to cause additional loss of habitat for bald eagle.

Roads can cause a wide variety of effects to terrestrial wildlife. Species, such as gray wolf and grizzly bear, are adversely affected by repeated encounters with people. Roads can increase harassment, poaching, collisions with vehicles and displacement of special status wildlife species.

In the context of special status fish species, historic stocking of non-native sport fishes has displaced native fishes (bull trout, westslope cutthroat trout, Yellowstone cutthroat trout, and Arctic grayling to some extent) from the majority of their historic habitat in the Planning Area.

Restoration and maintenance of the Muskrat Creek population of westslope cutthroat trout has beneficial cumulative effects in many places within the Upper Missouri River watershed. Westslope cutthroat trout from Muskrat Creek are currently being used by Montana Fish, Wildlife and Parks as brood stock for re-introduction of this species in several streams within and near the Planning Area. Muskrat Creek fish are also being collected and used in development of a westslope cutthroat trout broodstock that will be used throughout the Upper Missouri River watershed beyond the Planning Area boundaries. The proposed mineral withdrawal of 180 acres of riparian areas in the Muskrat Creek watershed under Alternatives B and C would protect westslope cutthroat trout habitat in 2.4 miles of stream from direct effects of potential mining activities. This benefit would not take place with either Alternative A or D as these alternatives do not include the proposed withdrawal.

Cumulative effects to special status plant species across all land ownerships in the Planning Area would be habitat loss, destruction of individual plants, habitat conversion to less than marginal habitats, and loss of habitat connectivity and variability.

Noxious weed management may have the greatest potential to affect special status plant species and habitat conditions under all of the alternatives. Ineffective control of noxious weed spread would lead to habitat degradation and loss. Herbicides used to control noxious weeds could have a cumulative and detrimental effect on potential future special status plant species (i.e. species which are not considered imperiled or threatened now, but may be in the future.) Unauthorized herbicide treatments could potentially have detrimental effects on special status plants and habitat.

Activities implemented on non-public lands could detrimentally affect special status plant populations in a manner that contributes to federal listings of special status plants. Although the BLM could not change the way other land owners manage special status plant species, the development of conservation agreements and species management plans with other land managers/owners could potentially reduce these off-site effects to special status plant species. The BLM would consider these effects in the analysis of all proposed management activities that affect special status plant species and their habitats.

Because Alternative A would provide the least protection of special status species, it may contribute to adverse cumulative impacts resulting from activities on adjacent lands, particularly wildland fire, residential development and grazing. Alternatives B, C, and D would improve conditions to varying degrees, but due to the limited extent of BLM's influence on management across the Planning Area, these effects would not likely be measurable or distinguishable at the Planning Area scale, with the exception of the proposed Muskrat Creek mineral withdrawal in Alternatives B and C described above.

Wildland Fire Management

Residential development and population increases could create more Wildland Urban interface areas. Additional interface areas could increase potential ignition sources, the need for fire protection services, and the potential need for fuel treatments. Residential development and population growth could also result in an increase in the numbers of recreational users and create the potential for more human-caused ignitions on public lands. As a

result, an increase in these activities would also add risk to firefighter and public safety.

Compared to the present levels of fuels treatments, there could be an increase of treatment acres over the long-term across federal, state, and private lands. As a result more acres would move toward historic fire regimes and a reduction of fuel loading would occur. Where treatments have been implemented, future fire intensity and severity could be reduced. Urban interface areas would be the highest priority for treatment. This could increase conflicts with visual concerns, smoke emissions, and funding for these projects.

Cultural Resources

Cumulative impacts to cultural resources could occur through incremental degradation of the resource base from a variety of sources and all ownerships. Degradation which reduces the interpretive and informational potential of historic and prehistoric properties, or affects the traditional cultural values important to Native Americans impacts cultural resources. Potential impacts could stem from vegetation management, recreation, travel route closures and development, wildland fire, wildland fire suppression, mineral/oil and gas development, increases in human population and vandalism.

Other regional resource, land use and economic development planning could affect the types and intensity of uses on lands within the Planning Area and could potentially affect regional cultural resources, in addition development of lands not protected by federal or state cultural resource statutes and regulations could further decrease the resource base and limit cultural resource management opportunities in the Planning Area. Planning coordination at the regional level could help protect important cultural resource values.

Paleontological Resources

Cumulative impacts to paleontological resources would be similar to those described in the *Cultural Resources* section.

Visual Resources

Activities such as timber harvest, mine development, subdivision and development, road construction or the occurrence of wild and prescribed fire on adjacent lands will continue to impact the visual features of form, line, color, and texture. These changes will influence development of similar projects on BLM lands where visual resource management objectives are a consideration.

Alternative C provides for the least amount of forest products removal, thereby resulting in the least cumulative impacts on visual resources. Alternative D could have the greatest impact on visual resources in the Planning Area due to its highest level of proposed vegetation treatments.

CUMULATIVE EFFECTS ON RESOURCE USES

Forestry and Woodland Products

Private and state forests and woodlands would tend to be managed for timber products and commodities while federal lands would tend to be managed for forest health and restoration with associated commodity outputs from restorative vegetation treatments.

Additional effects on forested vegetation would occur from stand replacing fires; continued fire suppression necessary as a result of increasing wildland urban interface; intermingled land ownership; and large-scale insect and disease outbreaks that are likely to continue throughout the planning period.

Fuel build-up on adjacent lands could influence the susceptibility of BLM stands to high severity fire events. Insects and diseases present in adjacent forest stand could impact BLM forest. Loss of forest resources due to insects and disease and wildfire events occurring under the current declining forest health and fuel conditions could result in long-term resource impacts and a general reduction in the future availability of forest products from the stands impacted by such events.

On BLM lands Alternative D would provide the most forest products and contribute the most to long-term forest health improvement due to restorative vegetation treatments. Alternative B would provide the next highest contribution to these effects, followed by Alternative A, then Alternative C.

Livestock Grazing

Potential cumulative impacts on livestock grazing would occur from a combination of activities and land uses occurring within the Planning Area. Such impacts would result primarily from surface-disturbing activities such as road construction, mining operations, and possibly some vegetation treatments, that reduce the quantity of available forage. These activities result in livestock displacement and direct removal and indirect degradation of forage, regardless of land ownership.

On BLM lands, mine reclamation efforts and some vegetation treatments would increase forage for livestock to a similar degree in all alternatives.

BLM lands would provide less than one percent of the AUMs available in the Planning Area under any of the RMP alternatives. The variability in livestock grazing by RMP alternative would have a negligible effect on livestock grazing at the Planning Area scale.

Sale, subdivision, and residential development of rangeland on private lands will likely increase in the future and reduce the amount of livestock grazing in the Planning Area.

Energy and Minerals

Leasable Minerals

Oil and gas resources would be removed by producing wells on leases.

Oil and gas development will have the potential to occur on BLM and other lands within the Planning Area, Alternative C would reduce the available mineral estate more than other alternatives for a total of 88 percent.

Alternatives A, B, and D are similar within the extent of the Planning Area and would maintain current development levels. However, under Alternatives B, C, and D the impact to federal leases would be a reduction in lease value resulting from stipulations and regulations. The impacts to lease developments would result from a reduction in wells drilled on leases encumbered with stipulations, an increase in wells drilled on leases with minimal constraints, and an increase in operating costs because of land use decisions, lease stipulations, and regulations.

Restrictions on federal leases could impact the leasing and development of adjacent non-federal leasable minerals. If an exploration company cannot put a block of leases together because of restriction on federal leasable minerals, the private or state minerals may not be leased or developed. Leasing of federal minerals on the other hand, could encourage the leasing of private or state minerals.

Locatable Minerals

Within the Planning Area, all the RMP alternatives would generally have similar impacts on locatable mineral exploration and development. While there are differences in the levels of restrictions between the alternatives, the majority of the lands in all categories of mineral potential, high, moderate, and low, would be open to mineral location. There would be little discernible cumulative effects on locatable minerals associated with the RMP alternatives.

Salable Minerals

The effects on salable minerals would be similar between RMP alternatives, and have a minor contribution to cumulative effects within the Planning Area.

Recreation

Demands for recreational opportunities and resources will continue to increase with increases in population. Development of private and other state and federal land will decrease the resource base available for recreation putting further pressure on BLM resources.

Potential impacts also include management directed activities such as prescribed fire, thinning, timber harvest, weed control, riparian restoration, wildlife habitat improvement, and other activities which would affect recreational experiences in the short term but provide long-term resource benefits.

Mineral and gas leasing on BLM or adjacent lands may limit recreational opportunities due to area closures, development of facilities, roads, and increased traffic.

Alternatives B and C would provide for greater solitude on BLM lands by reducing road access. However, they also concentrate motorized use which increases impacts on recreation values and facilities.

Recreation management and enhancements along the Missouri River would continue to be coordinated in a comprehensive manner by numerous agencies and the public through a multi-agency MOU and the Missouri River Comprehensive Recreation Management Plan.

Travel Management and Access

Cumulative effects to travel management and access are discussed in the Cumulative Effects portions of the "Environmental Consequences of Five Site-Specific Travel Plans" section.

Transportation Facilities

Continued growth in population and demands for recreation facilities is expected. Furthermore, impacts could occur as the result of population growth, changing recreation values and changes in accessibility on other federal state and private lands in the Planning Area. Changes in resource availability (funding) for continued compliance monitoring, weed control, signage and maintenance of roads and trails could affect transportation facilities. Regional coordination of recreation and travel planning could reduce potential impacts on facilities in the Planning Area.

Alternatives B and C provide the least miles of open road and could concentrate recreation and other forest uses; having the greatest effect on existing facilities.

Lands and Realty

Demand for communication facilities, road rights-of-way, and utility corridor rights-of-way and permits for communication sites will increase as population increases and if resources are developed in the area for mineral or power generation. In addition, development of adjacent federal, state, and private land will increase the need for utility and communication equipment and right-of-way development.

CUMULATIVE EFFECTS ON SPECIAL DESIGNATIONS

ACECs

No other agency in the Planning Area has ACECs so there would be no cumulative effects from ACEC designations. Impacts from activities implemented on adjacent land not managed by BLM could create additional cumulative impacts to relevant and important values in an indirect fashion. Lack of noxious weed abatement on adjacent land could impact relevant and important special status plant values, and exercise of water rights could result in impacts to water or wetland-based values. Upstream de-watering actions above Spokane Creek or Humbug Spires would degrade aquatic and riparian habitats as well as fish spawning activities. Adjacent land disturbances to soils and vegetation from development actions could create both short and long-term air quality, soil erosion and visual impacts within potential ACECs. Finally, trespass actions such as grazing, timber harvests, motorized travel, and created routes within the ACECs could cause serious impacts to relevant and important values.

National Trails

Resource management decisions or actions on state, private, and other federal lands have the potential to affect designated National Trails in the Planning Area, particularly since segments of both National Trails are across other agency lands and potential cumulative impacts are difficult to estimate.

Wild and Scenic Rivers

Potential impacts to outstandingly remarkable values from present or future projects or actions on lands within the Decision Area would be considered to be negligible to nonexistent because of the existing protections under current laws, regulations and policies. Water related projects on streams within the Decision Area have had an influence on natural stream flows, but not to the extent to alter their free-flowing nature. However, impacts from activities implemented on adjacent land not managed by BLM could create additional cumulative impacts to outstandingly remarkable values. Should upstream water users fully exercise their water rights during low flow periods, both the quantity and quality of water flows within BLM segments would be degraded. In addition, wetland plant species and fisheries would be impacted. The lack of weed control efforts on proximity lands could impact special status plant species and native vegetation. Poor livestock grazing practices upstream could alter water quality and adversely impact aquatic communities. Finally, additional residential developments or other soil disturbing activities could have detrimental impacts on Wild and Scenic Rivers as well.

Wilderness Study Areas

There are several wilderness areas within the planning area on Forest Service lands. In addition the FS has other areas that are under wilderness review. There are no known legislative bills pending before Congress that affect these areas. The wilderness characteristics of the six existing WSAs will continue to be protected under the Interim Management Policy and Guidelines for Lands under Wilderness Review until Congress acts and therefore impacts to these values are unlikely.

CUMULATIVE EFFECTS ON SOCIAL AND ECONOMIC CONDITIONS

Social and Economic

No cumulative impacts were identified for Environmental Justice.

Social Conditions

Under all the RMP alternatives, public access and recreational opportunities have the greatest potential to affect social conditions. As such, Alternative C, being the most restrictive on public access for firewood and other product gathering as wall as motorized recreational access, would have the greatest cumulative effects. Other federal land management agencies in the Planning Area are following a trend of reducing motorized access. Alternatives B and D also reduce motorized access and would have some cumulative effects as described above, but not to the same degree. Alternative A maintains current access.

Economic

BLM's contribution of outputs compared to the overall output in the Planning Area is relatively minor and cumulative impacts from BLM resource management would likely not be noticeable.

The differences in timber production between the alternatives would be less than five percent of the annual timber volume removed from the Planning Area.

Reduced AUMs in Alternatives B and C would place additional grazing pressure on private lands and/or increase the demand for hay or other forage alternatives. Expanding recreational demand across all alternatives could increase opportunities for private sector business growth.

While some BLM actions may affect individuals or businesses in a few communities, none of the alternatives would cause more than one percent change in local employment or labor income over the eight-county planning area.

Public Health and Safety

Under all alternatives, BLM actions to reclaim abandoned mine lands should contribute to a cumulative beneficial effect to public safety by reducing the num-

bers of hazardous mine openings and improving water quality in areas where projects occur.

Tribal Treaty Rights

Cumulative impacts on cultural resources may occur through incremental resource degradation. Decreases in resource conditions such as water quality, riparian habitat, wildlife forage, native plant communities, or land tenure and access could affect cultural, traditional, and other tribal treaty rights important to Native Americans. If resources were to become scarce on BLM lands or other adjacent federal lands, there could be increased competition between tribal members and non- members for these resources.

Ongoing consultation would strengthen the government-to-government relationships between the Butte Field Office and tribal entities associated with the DA. These relationships would help preserve resource availability and access to those resources guaranteed by treaty.

GLOBAL CLIMATE CHANGE (GCC)

The science of assessing "greenhouse gas" (GHG) emissions and their effect on global climate change is in its formative phase; therefore, it is not yet possible to predict with confidence impacts to climate from particular sources of GHG emmissions. The lack of scientific tools designed to predict climate change on regional or local scales also limits the ability to quantify potential future impacts. This is due, in large part, to the lack of historical baseline data from which to form definitive conclusions (Easterling et al. 1999), so various predictive models have been formulated to explain GCC. Generally, these models lack the predictive ability to be of use at a site-specific scale to aid in land management practice decision making and can even offer contradictory predictions (Zhang 2003). Efforts are underway by other agencies and educational institutions to improve climatic monitoring with GCC in mind, which may in the future lead to better analytical tools for analyzing and quantifying the effects of land management activities on GCC as well as the effects and trends of GCC on natural resources. Because the tools and necessary level of information are not available to address net effects of climate change quantitatively, impacts in this section are described qualitatively and are "common to all alternatives."

At the scale of the state of Montana, greenhouse gas (GHG) emissions associated with the Butte RMP would be minimal. Leading sectors emitting GHGs in Montana include electricity (26 percent), agriculture (26 percent), transportation (20 percent), and the fossil fuel industry (11 percent). Most activities associated with GHG emissions that may be authorized consistent with the Butte RMP would fall under transportation (public use of BLM roads), agriculture (livestock grazing), and the fossil fuel industry (fluid mineral leasing). At approximately 307,300 acres, the Decision Area for surface management makes up 0.3 percent of total acres state-wide. The approximately 652,000 acres of federal mineral estate in the Decision Area make up 0.7 percent of state-wide acreage. There are no activities proposed with this RMP that would be disproportionate contributors to GHG emissions beyond other contributing activities in the state. Montana GHG emissions make up 0.6 percent of total gross emissions in the United States (Center for Climate Strategies 2007). However, most BLM acres in the Decision Area are vegetated where carbon sequestration occurs and where proposed vegetation treatments would emit GHGs during implementation, but would tend to foster improved carbon sequestration in the long-term. Net effects of all these activities are unknown.

It is important to note that many of the projected effects associated with global climate change described for specific resources or resource uses would occur at variable rates, mostly over the next several decades to a century. The monitoring approach described in **Appendix N** of this RMP is intended to provide for flexibility to alter management as needed based on site-specific conditions to respond to changes that may occur for particular resources or resource uses. A more specific monitoring plan will be described in the Approved RMP that will be released with the Record of Decision for this plan.

IRRETRIEVABLE OR IRREVERSIBLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., loss of special status species habitat or the disturbance of a cultural resource).

Actions that alter a vegetation community sufficiently enough to change the site potential, or give other species competitive advantage over native species may represent irreversible commitment of resources. Mineral development would result in the loss of vegetation resources, habitat, and wildlife and livestock forage. While reclamation of disturbed areas would reduce the magnitude of these impacts, loss of wildlife habitat could result in altered migration patterns and displacement of local wildlife populations. Irretrievable losses to visual characteristics near mining sites would occur during development and operation. In addition, irretrievable loss of forested habitat could result from wildland fire, insects and disease, or harvesting. Most forest habitat loss, while long-term, would eventually regenerate and is therefore not irreversible. Without vegetation treatments,

noxious weeds or invasive species may not be reasonably controlled, potentially resulting in an irreversible change in ecosystem health.

Alternative A, having the most miles of open road, could contribute to irreversible impacts on passive or wilderness experiences if OHV use continues to grow. Cultural resources are by their nature irreplaceable, so the alteration or elimination of any such resource due to management under one of the alternatives, represents an irreversible and irretrievable commitment. There would be no irretrievable or irreversible impacts on recreational resources if management restrictions were implemented effectively. The exact nature and extent of any irreversible and irretrievable commitment of resources cannot be well defined due to uncertainties about location, scale, timing, and rate of implementation, as well as the relationship to other actions and the effectiveness of mitigation measures.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are impacts that remain following the implementation of mitigation measures, or impacts for which there are no mitigation measures. Some unavoidable adverse impacts would occur as a result of proposed management under one or more of the alternatives.

Vegetative treatments including prescribed fire could cause displacement of wildlife, decreases in quantity and quality of forage, and loss of non-target ecosystem components. Changes in the amount of recreational visitation and patterns of use could result in increased conflicts between users, vandalism, and illegal collection of cultural resources.

Other unavoidable adverse impacts also result from public use within the Planning Area such as development of mineral resources which could create visual intrusions, soil erosion, compaction problems, or loss of vegetation cover. Accidental introduction of exotic plant or animal species could result in harm or loss of populations of native plants or animals. However, proposed restrictions on recreation, livestock operations, and other land use authorizations to protect sensitive resources and other values would lessen the ability of operators, permittees, individuals, and groups to use the public lands and could increase their operating costs. Potential unavoidable adverse impacts could range from short-term to long-term and are difficult to quantify.

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